COAL AGE

Volume 15 New York, March 13, 1919 Number 11

Humanizing Industry

By Floyd W. Parsons

TWO kinds of people are a menace to America. They are both extremists. One has too much imagination; the other too little. Both are selfish, unreasonable and autocratic. Both work from different ends toward the same unhappy center. There would be no violent radicals if there were no ultra-conservatives. One is the fruit of the other's planting.

In every industry throughout the United States are men who refuse to advance with the times. They hold steadfast to ideas of the 1890 blend. In their outlook on business they do not recognize any need to study human reactions, although they would not think of building a machine without first getting a satisfactory report on the properties of the materials entering into it from the company's research laboratory.

Industrial troubles in recent years have come largely from an effort on the part of many employers to make workmen act as nearly like machines as possible. A new mine is opened or a factory started, and men are poured in very much the same as metal is poured into a mold. If labor is plentiful, the men pour easily. However, one thing is overlooked, and that is the fact that there is a decided difference between getting a real working force and filling a mine with men.

The employer cries aloud against his large labor turnover. When asked the reason, he attributes it to human perversity. He does not investigate carefully, or he would soon discover that job changing is unnatural; the normal man wants to settle down and have a permanent home and a steady position. One truth is now recognized, that the worth of a management can be determined by the size of the labor turnover.

It is interesting to know why a workman will loaf consistently each day and then work diligently on some task at home after hours. Let the manager ask himself, "Is this the fault of the man or the job?" When a man is more interested in doing something outside than he is in attending to the job for which he is paid, it is a sure sign that the employer has withheld from him all measure of personal responsibility. He has been permitted to work in monotonous fashion without any understanding of his real value in the final outcome of things.

No workman can be efficient unless he knows that his accomplishments will reflect credit or discredit upon him, according to the skill he exercises. He must be permitted to satisfy his creative instincts. He must be taught that the most perfect machine is only a tool; that he is its master and can make it effective or not, just as his skill directs. Not until the workman feels the sense of mastery will he assume responsibility. Idle machine hours and high costs exist where men and machines are equal.

It is all very well to talk of supervision from above, but there is greater efficiency when supervision springs from below. The man who is truly creative does best unde a policy of self-supervision. Stop a minute and investigate the cause of success of certain managements. It will be found that this success is based on a policy of satisfying the natural instincts of employees.

The primary instinct of a man is to preserve his family. This means he must receive a minimum wage that will afford a certain degree of comfort and pleasure besides a mere sustenance. No man can think of his work with pleasure if it provides him with a bare living. And right here it is important to note that a living wage is not measured by the amount a workman receives in any one week, but by the income he receives for his year's labor. As a natural sequence it follows that where consumption has not been curtailed by high prices, the more idle days that occur in an industry the higher the wages must be fixed to afford the workmen in that industry a decent living. A bear can go into his cave and live on nothing for several months, but not so a human being.

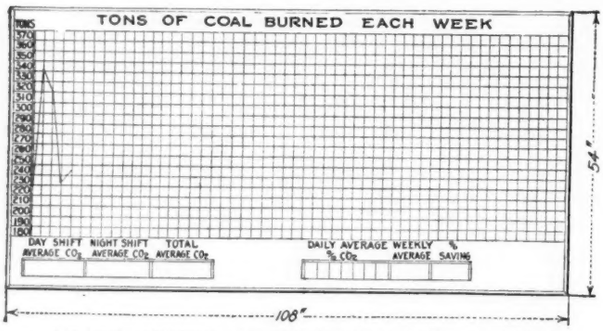
The coal industry is confronted by a serious problem. Plans must be perfected to make the production of coal something more than a seasonal affair. Capital and labor cannot go forward in harmony unless first there is regular employment for the men at a minimum wage. It is useless to discuss ways leading to efficiency and cooperation in and about the mine unless there is a base wage for the miner that will fully cover his cost of living through the full year. After this is a fact we can go on and talk of better results through self-government, and of quality and quantity production through a superior kind of industrial democracy.

IDEAS AND SUGGESTIONS

Coal-Curve Board for Use at Power Plant or Mine Mouth

BY H. H. FINCH
Springfield, Mo.

The accompanying drawing shows a coal-curve board that may be used either at the power plant or the mine mouth. This board is 108 in. long and 54 in. high. It is made of good grade of flooring, scraped smooth and painted black with white lines. There are 52 spaces provided, each space representing one week. This gives a year's curve, which may be painted with white paint one year and another color the next. The board will



BOARD PROVED OF VALUE IN POWER PLANT

thus afford space for curves for three or four years, so that results can be readily compared. Such curves are extremely interesting and should be placed in or near the boiler room. The CO_2, which may be marked up daily for the day and night shifts, is also an interesting feature.

This scheme has been used at the plant of which I have charge since Jan. 1, 1919, and we have found it a fuel saver. The daily CO_2 percentage is marked in chalk and each fireman can see his work; and not only he himself but others can see his percentage. I made a drawing of this board and had it built and painted at the plant. The squares are of 2-in. dimensions.

A board of similar design might well be used at the mine entrance to show the weekly output of the operation. In such a case a second curve might well be drawn showing the number of total employees or miners. The average output per miner or per employee might be drawn as a third curve.

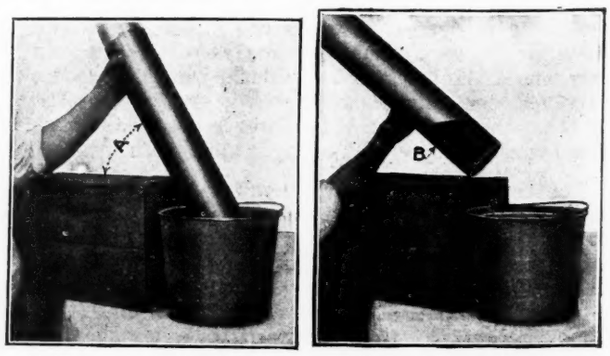
Novel Method of Moving Cars Back and Forth on a Switch

It frequently happens that one industry may with advantage borrow or adopt an idea or device from another with which it has no direct relation or point of contact. The following scheme for moving empty or partly loaded cars might well find application at many mines. In a mill where it is necessary to unload grain from railroad cars at several points, and to load the finished product at different places along the warehouse platform, there is a problem of moving the cars back and forth on the switch. The empty cars can be moved by manpower, but a car that is partly loaded requires a switch engine, which is not always available.

The Pasco Flour Mills Co., of Pasco., Wash., a new mill that has installed electric drive throughout, is utilizing its drive in an ingenious manner to solve the problem of car switching. The mainshaft in the mill is driven by a Westinghouse 40-hp., three-phase motor. A countershaft, driven from the mainshaft, projects through an aperture in the wall of the mill to the loading platform. Attached to the end of the countershaft is a steel spool, or niggerhead, on which a coil of 1¼-in. rope may be wound. The loose end of this rope is attached to the coupling of the car to be moved, by means of a steel hook. By throwing the countershaft in gear the drum revolves and moves the car. The direction of the pull from the drum is made by changing the winding and lead of the rope on the spool. The device is homemade.

Inexpensive Liquid Miter Makes Easy the Cutting of Angles

It is often desirable to cut or saw metal or wood at a special angle. Such an operation would necessitate the use of an expensive adjustable miter, the price of which is often too high for the work in hand. To overcome this difficulty at the least expense a liquid miter

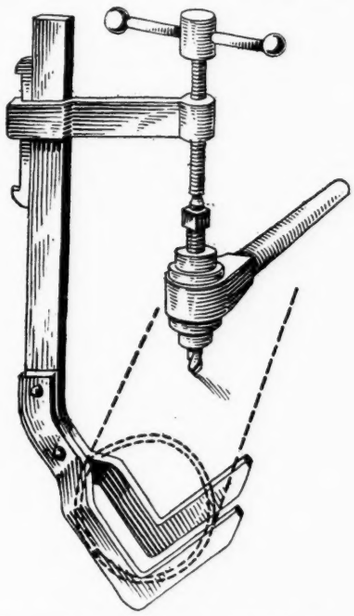


METHOD OF USING LIQUID MITER

may be substituted for use on wood and polished or dull metal. For polished metal, a few crystals of sulphate of copper are dissolved in a suitable container; the end of the piece to be sawed is placed for a few seconds in this liquid, in such a position as to form the desired angle to the horizontal shown at *A*. When allowed to dry, the copper solution will oxidize the piece, as shown at *B* and leave a definite guide line for cutting. For rough metals or wood a solution of lime may be used, thus leaving a clean, white line as a guide for the correct cutting of the angle.

Homemade "Old Man" for Drilling Pipe

The device shown in the accompanying illustration is homemade, and is used for drilling pipe. These are placed on the saddle, which consists of two iron straps, bent and riveted to form a fork-shaped end piece. The



SIMPLE DEVICE AIDS IN DRILLING PIPES

adjustment for the height of the arm on the main bar is made with a wedge, which bears against the bar. The feeding of the ratchet drill is done by means of the feedscrew shown. This device is comparatively light, weighing ordinarily only about 4½ lb., and is therefore easy to handle.

Readers are invited to send in practical and helpful ideas for this department. Help make these pages the most valuable in the paper. Liberal remuneration for all articles published.

Efficient Locomotive Haulage Depends a Great Deal on Motorman

By E. Steck
Hillsboro, Illinois

There has been considerable discussion in the past regarding the proper size of locomotive and motor equipment required to haul a trip of cars where the number of cars, weight of car and capacity have been given, as well as the grade conditions and the distance of the partings from the bottom. Theoretically this is a simple calculation; but practically it must be considered from many angles. The theoretical formulæ have often been stated, but just as much consideration should be given to the practical end. The following must be taken into consideration: Motorman, sequence of grades, condition of rails, delivery of cars to partings, capacity of bottom, bonding, trolley and feeders.

The motorman can greatly overload a locomotive that is theoretically the correct size by stopping on or at the bottom of grades against the loads, making it necessary to cut the trip in two; whereas a good motorman would take the grades with sufficient speed to enable the momentum to help carry him over. The poor motorman will use excessive sand on grades to keep the wheels from slipping, but at the same time greatly increasing the electrical resistance between the wheels and rails and thereby reducing the hauling capacity. Such a man pays no attention to the number of cars per trip, sometimes coming to the bottom with a very small one and then again with a trip much too large. Either too small or too large a trip will cut down the tonnage capacity of the locomotive.

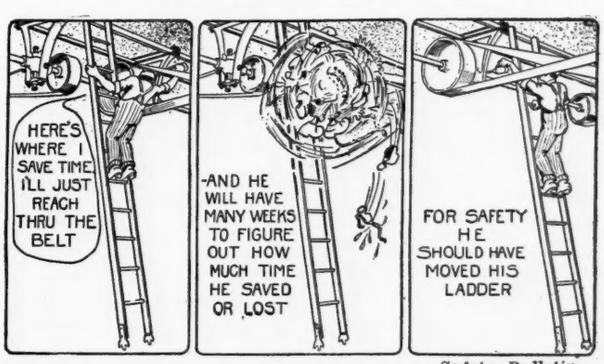
If haulageways are rolling, the grades with the loads can be utilized to some extent to obtain enough momentum to help pull over the grades against the loads. If all the grades are against the loads, a larger locomotive will be required for the same per cent. grades than in the first case. Right here is an opportune time to state that a locomotive operating over an entry which has a short steep grade against the load will not require as large motors as one operating over a perfectly level road.

Where a short steep grade occurs, the size of the trip is limited by the slippage of the wheels on the grade. This trip is obviously much smaller than the one that would be required to slip the wheels on the level road. In the first case the locomotive is only fully loaded on the hill, and while running over the level part of the road it is underloaded; in the second case the motor is fully loaded all the way. As the capacity of the motor is limited by its heating, which in turn depends on the amount of current and the time during which this flows, it is readily seen that the locomotive fully loaded on level track has the hardest work to perform.

A locomotive will pull more over a dry, clean rail than a wet, sandy or dirty rail. If the working conditions are such that the partings from which a locomotive pulls cannot be kept full enough to make a proper trip, the locomotive will be underloaded or, in other words, too large. If on the other hand the parting holds too many cars, the motorman is tempted to pull them all, overloading the locomotive. In either case the locomotive will not deliver the maximum amount of coal possible.

If the bottom is small, or if the hoist is slow, a large locomotive is not practical, as the bottom will become blocked. In such a case a small locomotive could be used to better advantage.

He Tried to "Save" Time


HERE'S WHERE I SAVE TIME I'LL JUST REACH THRU THE BELT
-AND HE WILL HAVE MANY WEEKS TO FIGURE OUT HOW MUCH TIME HE SAVED OR LOST
FOR SAFETY HE SHOULD HAVE MOVED HIS LADDER

—*Safety Bulletin.*

LIKE ALL WHO GAMBLE WITH THEIR "LUCK" THIS MAN LOST—AND PAID THE PENALTY

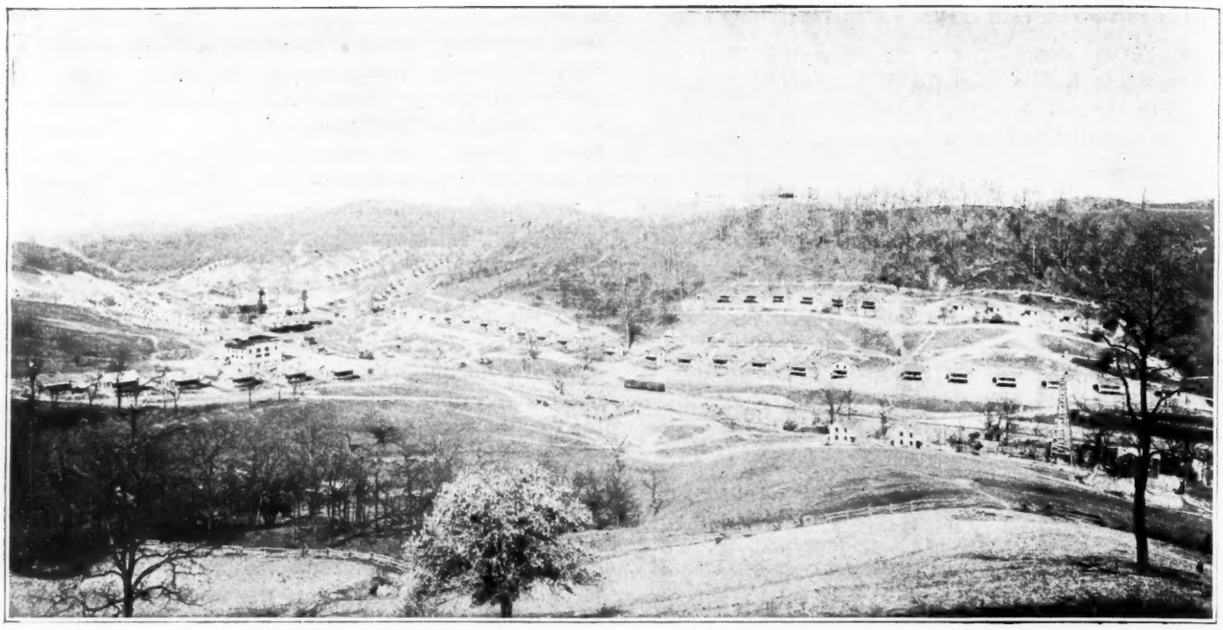


FIG. 1. GENERAL VIEW OF NO. 87 PLANT AND TOWN OF IDA MAY

Modern Shaft Development of the Consolidation Coal Company—I

By George W. Harris
Editorial Staff, *Coal Age*

THE old wooden frigate with all sails set looked every inch a sailor—years ago. It loomed up much more imposing at a distance than the modern dreadnaught, deep set and with its decks almost awash. What a transformation time has wrought! The new type includes every mechanical device adapted to the many services required in operating the modern craft. Manual labor has been done away with wherever practicable. Turning from the sea to firmer footing, we have similar examples of time's changes. In the coal fields the old wooden tipples have not usually been scrapped, but were allowed to serve out their term of usefulness. However, when these old structures are to be replaced or when virgin territory is to be developed, the improvements partake more of the modern steel fireproof construction.

A new plant is the joy of all concerned. Here is an opportunity to cut loose from old methods. No patching up of old buildings and fitting in of new machinery on old structures here. The modern shaft development of the Consolidation Coal Co. at the head of Helen's Run, in northern West Virginia, is a typical case of this kind. The improvements started in this section reflect the value of the coal underlying this territory—it is one of the fine deposits of the Pittsburgh seam and worthy of the best efforts of manager and engineer in its extraction. Some 6500 acres of coal are included in this tract, which is to be attacked at two points about two miles apart; provision has also been made so that additional acreage can be mined at these plants if desired.

Mines No. 86 and No. 87, here referred to, are about seven miles due west from Fairmont. Their location is shown on the map of the Fairmont coal field on page 1150 of the Dec. 26, 1918, issue of *Coal Age*. They are practically in duplicate as far as layout of plant and tipple design are concerned, accordingly one only—mine No. 87—will be described and illustrated. This duplication of plant is also found in other coal fields in a limited number of cases. It is entirely in keeping with modern practice in this respect, as witness the history of the Liberty motor of recent fame. When a number of units are to be built which can be practically identical in design, then it would seem to be the part of wisdom to perfect this unit as far as possible and utilize it as a model.

A general view of mine No. 87 and the town of Ida May is given in Fig. 1, the store and surface plant being shown toward the left in the illustration. The surface plant at the mine is shown more in detail in Fig. 2; beginning at the left, and in the order named, are the tipple with the hoist house adjoining, the airshaft headframe and the shop. Mine No. 87 was started in April, 1915, and since that time a full-fledged operation has sprung into existence, only requiring another year's extension of underground work to bring the plant up to full capacity—3000 tons of coal in eight hours. This tipple is shown in perspective in Figs. 3 and 4, and the machinery and chutes are shown in section and plan in Fig. 5.

Coal-preparation buildings—both anthracite and bituminous—have seen many changes in the last 25 years. The modern breaker or the tipple is no longer a dark, barn-like structure. Especially since the free use of structural steel in their construction has great improve-

ment been noticed in the design of the buildings. Greater attention has been paid to the more efficient use of space and the better lighting of rooms where this feature is important. A gradual reduction in the height of breakers and tipples has been the tendency wherever practicable; this was brought about first by the use of elevators and further by the adoption of traveling tables and shaking screens, which replaced chutes and bar screens in part. The traveling tables, with their added refinements, designed to lessen breakage of coal, especially conserve lump and other sizes of bituminous. The dropping of coal is more and more eliminated, the loading boom taking coal from the tables places lumps in the railroad car in good condition; this is the last step in the greatly improved method of handling coal in tipples. If a concrete example was desired to illustrate the last word in bituminous tipples, possibly no better plant could be considered than the Ida May structure shown in the accompanying illustrations. In this tipple the dump hopper and first, or upper, shaking screen only are in the highest part of the tipple proper and the rest of the preparation machinery is in the low shed over the loading tracks. The lighting and ventilation of the interior of this building are largely accomplished by movable skylights—a common practice in modern shops but somewhat of an innovation in tipples. The floors and walks of the tipple are of concrete.

The No. 87 tipple is a strikingly low structure, being only about 43 ft. in height from the surface to the dump. Coal from the shaft is dumped into the receiving hopper, from which it is carried to the shaking screens by means of a heavy pan conveyor feeder. The screens are 8 ft. wide and are designed to handle at least 4000 tons per day. They are operated by the Allen & Garcia center crank drive and are carried on Peterson pendulum hangers, handled by the Allen & Garcia Co., of Chicago, Ill. The upper screen has two screening decks, the upper making lump over 1½-in. lip screens, the lower deck rescreening the 1½-in. slack over ¾-in. lip screens. Either 1½- in. or ¾-in. slack can be loaded on the second track and 1½ x ¾-in. nut coal can be loaded on the third track through a telescoping hinged chute. If the gates are closed, the nut coal or the nut and slack as well as the lump are carried to the lower section of the screen. The upper deck of the lower screen contains one section of 4 x 6-in. oval perforations, which are covered by a bolted veil plate when not in use. Below this point there is an interesting and novel feature consisting of two large vertically lifting gates each half the width of the screen; they are provided with sides and deflectors so arranged that the coal is divided equally between them. These gates are operated by means of handwheels and sliding nuts, so that they can be manipulated without stopping the screen and be held in any position without additional locking.

Thus a great variety of operations are possible: Run-of-mine, 1½-in. lump or ¾-in. lump can be divided between two 5-ft. picking tables and be loaded on the fourth and fifth loading tracks. The entire product can be thrown to either table. Or egg, egg and nut, or egg, nut and slack can be loaded on the fourth track with the resulting lump on the fifth track. In every one of these operations the coal slides easily to the discharge point, and there is no serious drop and breakage anywhere. The whole outfit was designed to handle lump coal especially, with the minimum amount of breakage, and it is questionable if there is another plant capable of making a better record in this respect. As an additional precaution each size of coal goes over a degradation screen just before reaching its loading chute or table, and the product of these screens is carried back into the slack car by means of a degradation conveyor.

When the lump or egg coal leaves the lower shaking screen it will pass over two picking tables and loading booms, where an opportunity is given for the removal of refuse. Only one of these tables has been installed up to date. Men stationed along these tables pick out impurities and throw them into the primary gob conveyor alongside. The primary line delivers to the main gob conveyor running along the outside wall of the tipple and emptying into a rock bin adjacent to the hoist shaft. This main conveyor and rock bin are shown

FIG. 2. VIEW OF THE SURFACE PLANT AT CONSOLIDATION COAL CO.'S NO. 87 MINE

on the plan and section, Fig. 5, and along the outside of the tipple, Fig. 4. When rock is hoisted in the shaft it is dumped into the receiving hopper, but is prevented from following the usual course of the coal by deflecting gates controlled by the lever *C*. Thus rock goes by chute to the rock bin.

When run-of-mine is to be loaded it can either go direct by way of the auxiliary mine-run chute into a car on the first track or be deflected by a gate (opened by the handwheel *A*) from the upper shaking screen into the principal run-of-mine chute. This chute loads by means of telescoping and hinged apparatus either into a car on the first or on the second track, the loading being controlled by a hinged vane. This system of run-of-mine chutes was designed to handle occasional runs of coal which might contain impurities—such coal being thrown to a car on the first track. The gates controlling these chutes are all operated from the dump-house platform, where the coal is inspected as it comes up in the conveyor feeder. The chutes leading to the first track have not been installed yet, but all arrangements have been made to have them placed in position eventually.

At present mainly run-of-mine is loaded at this plant. At times there is interruption to car delivery at the loading chutes and provision was made for such contingencies by providing a controller for the motor operating the feeder at the receiving hopper. This controller is located on the main floor of the tipple over the loading tracks. Outside foreman C. H. Shear devised a scheme whereby this controller is operated by the car trimmer standing on the platform while loading run-of-mine. Wires run from this point, over pulleys at turns, to a handwheel on a vertical shaft at the controller. This arrangement takes the place of the usual hand lever and does away with the necessity of keeping a man at the controller. A car retarder, made by the Fairmont Mining Machinery Co., of Fairmont, W. Va., is installed at each loading track.

Another quite interesting feature of this tipple (the idea originating with the designers) is the concreting of three sides of the hoist shaft from the surface to the dump. The steel members of this portion of the tipple frame are light and the concrete encasement was designed not only to give greatest strength and rigidity to the structure, but to keep coal and dirt from dropping inside the screening portion of the tipple. The concrete also protects the steel members from the corrosive action of the mine gases coming up the shaft. The designers of this tipple claim that they have met with great success with this style of construction and that they are using it on several of their newer tipples.

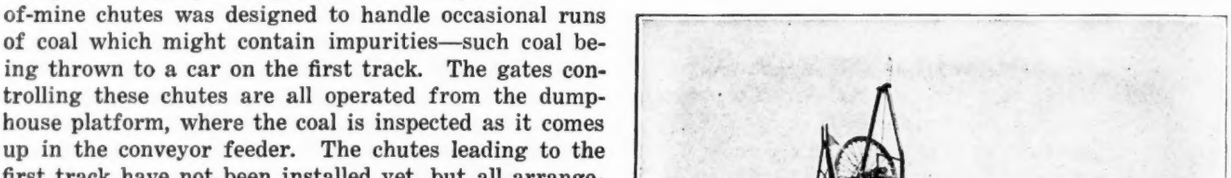


FIG. 3. LOOKING AT THE TIPPLE AT THE NO. 87 MINE FROM THE LOWER SIDE

Modern tipples and towers or headframes are generally equipped with some provision for instant and efficient handling of sheaves; in the No. 87 tipple a derrick combination is provided for this purpose. The derrick details are brought out in Figs. 3 and 4. A different method for handling sheaves is provided at the top of the airshaft headframe as shown in Fig. 2. This is the common method in use for the ordinary placing of sheaves.

Adjacent to the tipple is the house containing the electrically operated shaft hoist, fully described in the July 13, 1918, issue of *Coal Age* under the title of "Motor-Driven Shaft-Hoist Installation," by R. P. Hines. This hoist has a cylindro-conical drum operated

by a General Electric 1400-hp. motor on the Ward Leonard system of control, combined with the Ilgner flywheel method. This flywheel has sufficient energy, in case of the failure of current from the main supply line, to hoist and land a cage; thus it should not be necessary to stop the hoist at any point in the shaft on account of lack of power. It has been stated by Mr. Hines, the electrical engineer of the Consolidation, that this hoisting equipment is believed to be the initial one of its type to be installed in the eastern bituminous coal fields; safety features are provided covering all contingencies for man, load and operating protection. The engine house is of fireproof construction—brick walls and steel roof trusses.

During the early development days of the mine the man and material hoist shaft was used as a temporary coal shaft also; the smaller headframe shown in Fig. 2 is at this shaft. A 22 x 36-in. steam-driven, double, first-motion engine, made by the Connellsville Manufacturing and Mine Supply Co., of Connellsville, Penn., was installed at the shaft and used to hoist coal among other purposes. A counterweight is used to balance the single cage and rope, and runs in an adjoining compartment to the cageway of the shaft. A temporary wooden trestle was built from this shaft to the railroad track to enable the coal hoisted to be dumped into railroad cars for shipment. This trestle is still in place and can be utilized for loading coal should there be an interruption to operations at the main shaft.

In the same building containing the man hoist engine is the power plant for the limited steam requirements of the plant. Installed originally for shaft-sinking purposes, it is continued as a reserve source of power. The steam pipe covering used at this plant is asbestos sponge-felted, furnished by the H. W. Johns-Manville Co. The 6 x 20-ft. Lepley reversible mine fan at present is driven by a 22 x 24-in. steam engine, both made by the Connellsville Manufacturing and Mine Supply Co. It is the intention to equip this fan with an electric motor which will be the prime motive power, the steam drive being held as reserve in case of failure of electric power. It is essential that there be no interruption to the operation of the fan at this mine. The fan was designed to force 300,000 cu.ft. of air into the mine against a total water gage of 3.6 in. Steam is generated at this plant in three 100-hp. water-tube boilers made by the Erie City Iron Works, of Erie, Penn. The exhaust from the fan and the hoisting engine goes through a heater made by the Pittsburgh Feed Water Heater Co., of Pittsburgh, Penn. The feedwater is handled by Snow and Smith-Vail pumps, while a Cameron is held for emergency use. Adjacent to the engine room and under the same roof is a substation; here is a switchboard and a converter to change the line alternating to direct current, the equipment being furnished by the General Electric Co. It is of practical interest to note that the Consolidation company has a number plate attached to every piece of machinery about its plants. In case of necessary repairs to or removal of apparatus from one location to another, the number permits of a definite record being kept of each operation in concise form.

There are few cases where a shop of some description is not an important part of coal-plant equipment. In sections remote from establishments where difficult repairs can be attended to promptly, it may be essential to have a shop at the plant where such work can be done satisfactorily—the size of the plant often influencing the amount of the investment in this direction. A view of the substantial brick building used by the Consolidation at Mine No. 87 for a shop, supply and lamphouse is shown in Fig. 6; it is 35 x 160 ft. in outside dimension and about 18 ft. in height.

The shop utilizes about half of this space and the lamproom about a quarter of it. At present machines are being installed; two underdraft forges made by the Buffalo Forge Co., of Buffalo. N. Y., an emery

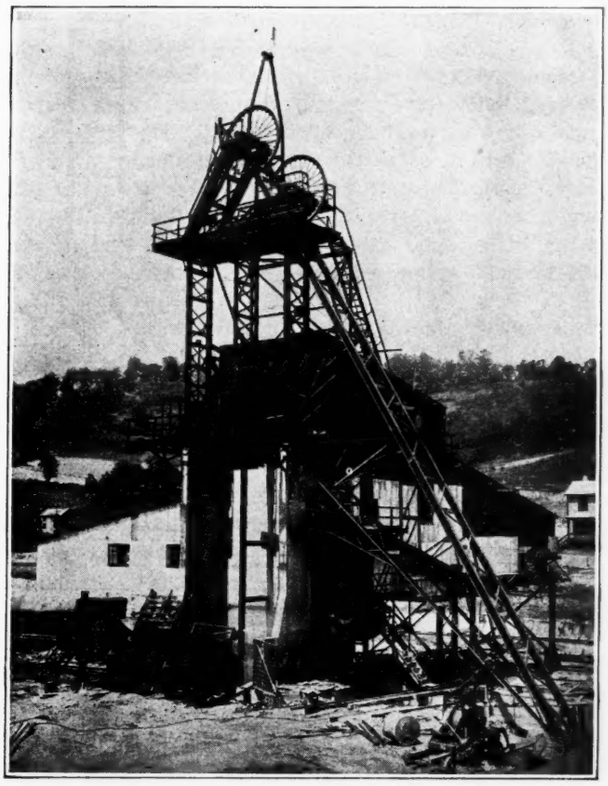


FIG. 4. THE TIPPLE AT NO. 87 MINE FROM THE UPPER SIDE

grinder, by the Norton Co., of Worcester, Mass., a drill press, by the Rockford Drilling Machine Co., of Rockford, Ill., and a few other of the usual accessories to mine shops are in place. It is expected to add other machines to this equipment in time, such as lathes, a steam hammer and so on. Smithing, carpenter and machine work are done in this shop.

The miners are required to use an electric mine lamp on account of the presence of gas in the underground workings at Mine No. 87; the Edison permissible portable (Model C) has been adopted for ordinary use. The mining machine runners and the firebosses carry Wolfe safety lamps, the former setting these lamps ahead of their work when undercutting. The electric lamps used by the miners are kept in proper condition and all repairing is done by the company, a nominal charge being made to the miners for the use of the lamp. The miners leave the lamps at the lamphouse on coming out of the mine at the end of the day's work and call for them again before going down the shaft to commence work. Racks holding 100 lamps each are ar-

ranged for holding them when not in use, and all lamps are numbered so that each man gets his own. The lamp is so well known as to need little description here; the storage battery, attached by a "cord" to the lamp, is charged at night for the day shift men and during the day for the men working at night. One hundred lamp batteries are charged at a time with current at 100 volts, the rheostat (furnished by Mine Safety Appliances Co., Pittsburgh, Penn.) being kept at one ampere.

The batteries are regularly inspected and water and solution added when necessary; as a rule the batteries are filled with distilled water twice a week and the solution is changed every eight or nine months. It takes about eight hours to charge the batteries ($2\frac{1}{6}$-volt lamps). There is one man on each 12-hour shift to look after the charging of the lamps and to do the ordinary repair work, such as wire renewals, repairs on the headpiece, and so on.

In the group of buildings about the shafts is the sand-oil-cement house, constructed of tile and cement. An oil-storage system installed by S. F. Bowser & Co., Inc., Fort Wayne, Ind., is used and several grades of

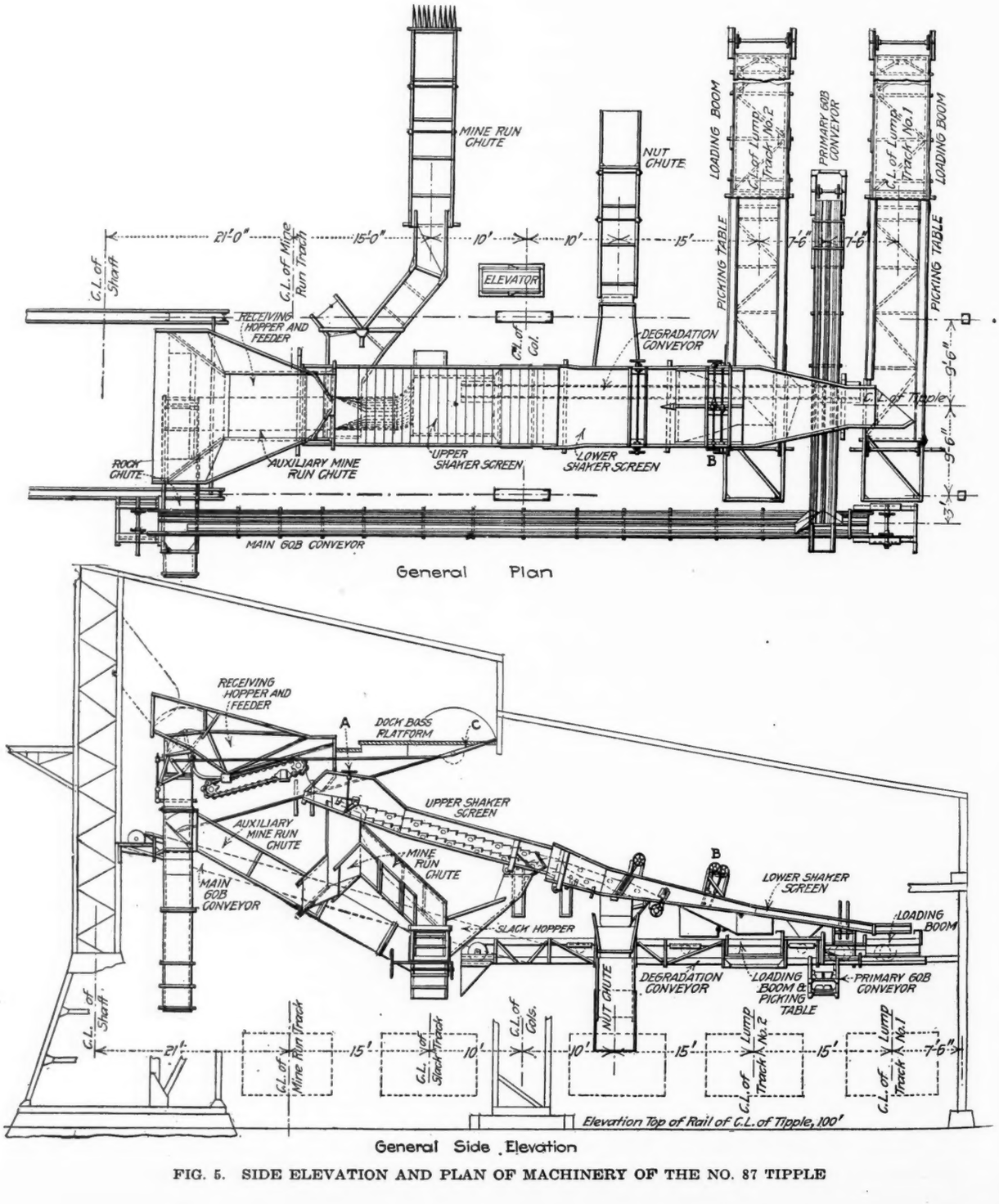


FIG. 5. SIDE ELEVATION AND PLAN OF MACHINERY OF THE NO. 87 TIPPLE

lubricants are kept—heavy black oil, for mining machines, a heavy engine oil and a lubricating oil for cylinders. On the mine cars "pit car oil," furnished by the Galena Signal Oil Co., of Franklin, Penn., is used. The main powder house is located up on the mountain side away from all other buildings, but the distributing house (10-ft. square) is adjoining the oilhouse. In this

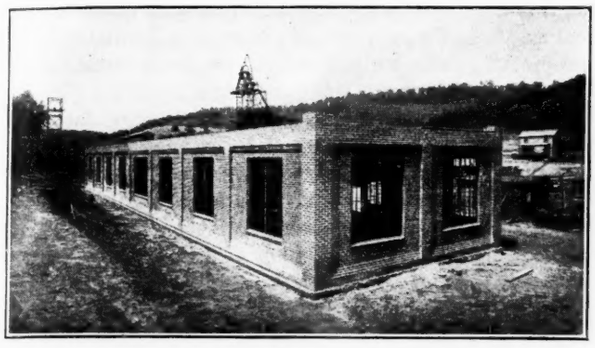


FIG. 6. SHOP AT THE NO. 87 MINE

latter house pigeon holes have been built around the sides of the room, one for each man. Monobel powder (manufactured by E. I. du Pont de Nemours & Co.) is used, and it is never necessary for any miner to take powder home as he can leave extra sticks in his pigeon hole at the distributing house and call for them again the next morning on his way to work.

(*To be concluded*)

Coal Operator and Central Station

The central power stations in Illinois have encountered many difficulties in the work of electrifying the coal mines along their transmission lines. The responsibility for the trouble rests with both the central stations and the coal operators.

The central stations have two difficulties to overcome. The first of these lies in obtaining the prospective customer's acceptance of the usual primary rate. This is really an arbitrary rate and is not made on any just basis. The usual primary rate is about $1.25 per month per kilowatt of maximum demand occurring during a definite interval of time. This charge is supposed to represent 15 per cent. of the cost of installing 1 kw. of station capacity to serve the consumer. The cost of 1 kw. is taken at $100, and 15 per cent. represents interest, depreciation and taxes or $15 per year.

Assuming that in normal times it does cost $100 per kilowatt to install the plant, and that the 15 per cent. charges are correct, is the central station justified in charging $1.25 per kilowatt of maximum demand, say on a basis of a 15-minute peak? The machinery is generally purchased on the basis of the capacity it will develop continuously, and not on its overload capacity for a short interval of time. The sum of the maximum demands of all consumers will greatly exceed the loads arising from these customers on account of the diversity factor, and because some are distinctively day loads and others night loads. Consequently, the maximum demand or primary charge should be reduced.

The central station will object to a reduction in the total rate due to cutting the primary rate, but this is unnecessary as the secondary rate could be increased to compensate for the loss. With such a readjustment both the central station and consumer would be benefited. The central station could more easily obtain the coal-mine load and the coal operator would not be required to pay the heavy primary charge when the mine is closed down because of labor troubles, accidents or lack of coal orders. The coal operator hesitates to sign the present power contract, carrying perhaps upward of $1000 a month primary charge, while he is confronted by the possibility of long idle periods.

The other great objection from the coal operator's standpoint is the disinclination of the central station to take the hoisting load without making the cost of the necessary machinery prohibitive. What I refer to is this: The central stations insist that large hoist motors must not be alternating current, but must be driven by special motor-generator sets which keep the line disturbance due to hoisting down to a minimum. Such equipment is generally excessive in cost. Where the change is being made from a steam to an electrically operated mine it is practically impossible to change over the hoist, with the result that the boiler plant cannot be entirely closed down; and the boiler plant is generally expensive to maintain.

If the central stations can get their power plants and transmission lines in such shape that large alternating-current motors can be used on mine hoists, they can greatly increase the coal-mine load on their lines.

On the other hand, the coal operator does not use the central station service to its maximum. Often only a motor-generator set is installed to operate locomotives and cutting machines underground, and no thought is given to the operation of the machinery on the surface. It is not unusual to see long, leaky, uncovered steam lines serving uneconomical engines for operating tipple machinery, car pullers, fan, shops, pumps, etc. The motor-generator set is probably operating under the lowest secondary rate, consequently if these engines were replaced with motors they would operate on the low rate, which would be greatly below the cost of fuel alone for running engines.

The central stations must educate the operators along these lines. They have not completed their task with the electrification of the mines, as the operators are liable to object to the payment of the power bills, which they really believe to be excessive. This is due to the fact that the power bills are payable on the first of the month and there is no question as to their amount. The cost of operating the steam-driven units now placed did not show up with such regularity, if at all. The coal burned under the boilers was probably only estimated—and greatly underestimated. The price probably was charged at the cost of production in place of at the selling price, and the cost of labor charged to other items where it did not show up as operating expenses against the small engines.

I have often heard the remark made: "Oh, it doesn't cost us a cent to operate that engine. It can't be noticed on our boilers, and we don't need any additional men as we need several around on the top anyway." Perhaps a dozen such small engines are employed at one plant. It devolves upon the central station to prove that it costs excessively to operate small engines.

American Opportunities in the Foreign Coal Trade

THE article printed below appeared in a recent issue of the *Colliery Guardian*, of London, England. It contains so concise an analysis of the conditions surrounding the exporting of coal and the possibilities of the United States obtaining a hold on foreign coal markets, that all who are interested in the export coal trade should read it. Although treated from the British point of view, there is still so much of truth and inherent sound logic in the article that it has been reproduced in its entirety.

IT GOES without saying that coal exporters in this country [England] are apprehensive just now as to the imminence of a concentrated effort on the part of United States coal operators to capture our pre-war markets. American competition has been heralded at various times in the last fifteen years without anything very serious happening to menace our position in Europe or South America, which are for us the principal zones of enterprise; but there can be no harm in considering whether the events of the past four years have added substance to the tenuous visions of the past.

A European Commission appointed by the United States Fuel Administration has just recrossed the Atlantic, following an investigation of the fuel situation in Europe. Their report, after enunciating the somewhat platitudinous statements that Europe is short of coal, and that fuel scarcity, creating unemployment, provides a fertile field for Bolshevism, records the fact that, whereas the production of Great Britain has fallen from 287,000,000 tons in 1913 to 230,000,000 tons in 1918, the output of the United States in the same period has increased by approximately 100,000,000 tons; further, that there is a considerable demand for American coal in Europe at the present time.

American Coal Output Increases Rapidly

It would be unwise to obscure the fact that the coal production of the United States has increased phenomenally since the opening of the present century, while that of the United Kingdom has done no more than preserve a rather unstable equilibrium; at the outset of that period we were still the world's chief producer of coal; now the single State of Pennsylvania produces more than we do. The moral of that is that a day must come sooner or later when British coal in many quarters of the globe will be supplanted by American fuel, even when allowance is made for the vast industrial development of America and her panoply of raw materials. But it is not easy to decide whether the war has precipitated that situation or not.

At the close of 1917, the United States was threatened with a fuel scarcity as serious as ours, but this was largely the result of car shortage, and, by the introduction of various measures, including "heatless Mondays," the situation was pulled round. In 1918 the output was 689,652,110 short tons, or an increase of 6 per cent. over 1917, and it was proved conclusively that the ability of American mines to produce fuel was greater than the ability of American industries to consume it. In a similar crisis, we more than failed to preserve the *status quo*, but the conditions were essentially different. There was a shortage of labor in America, but in no sense so acute as that from which we suffered in this country; wages rose in both countries, Pennsylvanian miners of the higher grades being able to earn nearly $8 per day in recent months, but this is counterbalanced to some extent by the greater per capita output—in 1917-18 the individual output, in West Virginia, including inside and outside labor, was just over 900 tons per annum, in the Pennsylvania soft-coal region over 1000 tons, as compared with 240 tons in British mines; in both countries the Government restricted selling prices and controlled distribution: there is this point, however, that in the United States every encouragement was given to operators to increase the productive capacity of their undertakings by the adoption of labor-saving machinery and large-scale remodeling of plants; whereas, in this country, Parliamentary and financial restrictions impeded even the work of normal maintenance.

American Operator More Economical

According to what has been known as the Peabody plan, coal operators in the United States were left very largely to deal with the problems of intensified production, so far as their internal affairs were concerned, and it has proved an undoubted success. It is too early as yet to gage the enduring effect of Government intervention in this country.

It is not an easy matter to determine the increased cost of production in America; according to the estimates of the Geological Survey the average value of coal at the mine rose from $1.32 per ton in 1916 to $2.25 per ton in 1917. In 1918, it is probable that the operation of a state-regulated basis may have kept pit-head prices at a level not very much in excess of the figure named. The cost of production has undoubtedly risen, but, due to the increased output per head and the introduction of measures to promote intense production, the ultimate increase may not have been very great. It is only fair, in making comparisons between Great Britain and the United States, to realize that the American coal operator has much greater margins for economy; the high output per head is largely attributable to the fact that there has been no imperative necessity for economy in mining methods; so much is admitted by American mining engineers, who do not make the claim to a monopoly of efficiency which some of our own pessimists attribute to them.

The present position is that stocks of coal in the United States are abundant, and there are signs of an abatement of the internal demand, due partly to the lessened requirements of the navy, and the rail-

roads and munition works, although great activity is anticipated in the iron and steel trades during the present year; labor is not too plentiful and may remain so, for the reawakening of national life in Poland and the other Slav states, from whom the United States has in the past drawn a large proportion of its coal miners, may not only retard the wave of immigration, but divert some of the existing labor to their native soil; during the war period the number of mines in operation increased by over 75 per cent., and it is calculated that overproduction during the present year may amount to as much as 100,000,000 tons; although this surplus will probably not be realized, it is clear that an outlet could only be found for it abroad; the regulation of prices may be relaxed, but there appears to be no intention for the present to abolish the price and zone regulations inaugurated in 1917, and it is not likely, in any case, that prices will return to their pre-war level, for in 1913 and 1914 the industry was suffering severely from overproduction and unremunerative prices.

In the twelve months ended June 30, 1918, exports of United States coal amounted to 21,051,979 tons, or 1,422,888 tons more than in 1916-17, but this increase was due to the fact that exports to Canada—her best customer—increased by 3,607,146 tons for the year; otherwise the expansion has not been very great. In 1911-12, 276,467 tons of American coal were exported to Italy; in 1912-13, 33,264 tons; 1913-14, 776,422 tons; 1914-15, 1,628,279 tons; 1915-16, 2,797,506 tons; 1916-17, 1,099,508 tons; 1917-18, 201,220 tons. In all, the United States shipped only 355,314 tons to Europe in 1917-18, as compared with 1,635,902 tons in 1916-17, and 3,591,281 tons in 1915-16. To the South American countries the decline in exports last year was also heavy; the Argentine took 247,613 tons as against 706,776 tons in the previous year; and Brazil 625,374 tons as against 156,059 tons. South America has been thrown back very largely upon native resources, the curtailment of imports of British fuel being equally great; in both cases the causes were the same—export restrictions and shortage of tonnage.

Important Factor Is American Merchant Marine

But there is one more factor, and it is one of considerable weight, namely, the possession by America today of a considerable merchant marine for the first time since the Civil War. It is estimated that by the end of this year the United States will own some twelve million tons of shipping. This new shipping will require a large increase in bunkers even if a great number of the new ships are constructed to burn oil; but the possibility of using it to capture our markets is qualified by at least three considerations; first, an enormous demand for the freightage of American goods intrinsically more valuable and profitable to the shipper than coal; second, the lower ballast value of American coal owing to the trade of the country being essentially an export and not an import trade; and third, the existing business connections of British firms. In reciting these factors it is not necessary for our purpose to emphasize the longer haul that has to be borne by, say, New River or Pocahontas coal before it can be put on board ship at tidewater, because this is offset by a lower price at pithead, and a lower railway rate per mile, so that it is probable that a good steam coal from these regions can be shipped f.o.b. at not more than $6 per ton.

At one time there seemed to be a prospect that America would oust us permanently from the South American market, but this was not realized even during the war, for eventually, in June, 1918, the United States Shipping Board, which two months earlier had taken over all free tonnage, concluded an agreement with the British government by which we agreed to keep out of Rio, and United States coal exporters out of the River Plate market. The latter was chiefly supplied with American coal—in British bottoms—but American exporters of experience are not too sanguine as to the success of a South American campaign in the near future; on that and other accounts the Administration has been loaded with abuse, exporters blaming the restrictive rates and licensing system instituted in 1917 for their inactivity, but it is only right to remember that British exporters have been called upon to suffer the same and greater evils ever since the outbreak of war.

Hopes and Illusions

The brutal fact is that, notwithstanding the alluring reports circulated by diplomatic and so-called trade emissaries abroad, the American coal trade, although its worship for the word "organize" is almost uncanny, has a lot to learn in regard to conditions prevailing in foreign markets, the fastidious likes and dislikes of customers, and other details which profoundly affect trade relations. In the past the Sherman Anti-Trust Law has been severely repressive of coöperative enterprise. The National Coal Association, an important war-time organization, is now planning the formation of an export association to develop a market for American coal abroad, the project being to pool all deliveries at tidewater and to conduct the further stages on syndicate lines.

Formerly it was contrary to Federal law for merchants to combine for such purposes, but the Webb-Pomerene Bill recently adopted in Congress concedes these facilities. At the same time, there are indications that there are groups of shipping companies that are willing not only to undertake the transportation and docking of the coal, but to offer financial facilities. A difficulty here is to distinguish between trade of a purely temporary character and cases where the exporter proposes to establish a permanent connection. The question of credit is one that has greatly hampered the American coal exporter in the past, but even before the war American banks had been enabled to establish branches in South America and elsewhere; and a large concern, known as the American International Corporation, exists for the definite purpose of financing shipments.

The present position of the United States, as the principal creditor nation, may ultimately prove of great advantage to merchants in their dealings abroad; for the present, however, the great accumulation of gold in the United States is prejudicial to the export of coal, as it will be preferable to pay for imports of such manufactured goods and raw materials as may be required in cash rather than in kind. Yet it is stated that Congress intends to raise customs duties,

in order to reduce importation, and thereby protect home industries. In that case it is probable that the rate of exchange will become even more unfavorable for the exporter; at present there is a premium in Paris of about 5 per cent. on New York drafts, and in Italy it is not less than 10 per cent. But when this excess of capital is dispersed, as it probably will be, by large investments in foreign industrial operations, the very existence of these holdings may assist to some extent in the creation of markets for essential materials.

It is well that we should be alive to such developments, but in the meantime there seems to be every prospect that British exporters will hold their own, especially where the markets are also the centers of an important trade with this country in food supplies, for in such cases it is an imperative necessity to keep open the channels of our import trade. Community of interest between exporter and importer makes a formidable combination, although it may, in this case, have been affected by the extinction of British investments abroad. But, for the present, the necessity to pay for imports by means of exports, rather than by means of interest on holdings in the country of origin, is a distinct advantage to the British exporter. What we probably shall see is a large extension of the American coal export trade through British agencies, a movement that had already gained momentum when the war broke out. Beyond that, it is indubitable that a day will come when the outer ramparts of our trade will be driven in—when British coal will not go, except in ships' bunkers, beyond the Suez Canal. It depends very largely upon the attitude of the working miner as to whether that day comes sooner or later.

That is in the womb of the future. For the present it is probable that the distribution of coal overseas will be a matter more or less of arrangement between the United States and British governments, based largely upon international and humanitarian considerations; the arrangement in South America being of this nature, as is the consignment of 100,000 tons of American coal to Holland.

At the present time, with the coal fields of Europe working far below their normal capacity, it is eminently necessary that full advantage should be taken of America's ability to make good the shortage, but it is equally important that no false sentiment of goodwill should tempt us to surrender permanently a trade that is in the highest sense a necessity to our existence. The greatest danger is that the shortsightedness of the British coal miner may encourage the foreign consumer to seek security by an alliance with the American producer; the latter then would possess just those advantages which have hitherto been ours.

USUALLY THE CHIEF ENGINEER of a large coal company is a man with a sufficiently broad experience to be able to write out practical specifications. However, unless these specifications are carefully prepared, bids submitted on them are not apt to be satisfactory. In one instance a proposal was made on so-called specifications and it amounted to approximately $20,000. On looking over this bid, the company decided to call in an expert engineer to go over the plans. The result was that another bid was asked for and submitted which resulted in a saving of over $6000 on the initial cost.

Did You Ever See a Ladder Like This?

The National Safety Council asks in a bulletin: Did you ever see a ladder like this? The answer is: Lots of them. The cross sticks are weak and shaky, the treads are many of them extremely uneven, the spacing of the rungs is unequal and too great, the ladder has been lengthened out in a manner none too safe; some of the rungs are so inadequate that the nailing of them in place inevitably has split and so weakened them. Play safe and discard all such ladders: A dozen different kinds of accidents may occur in the use of them. "Different accidents," we may call them, but one and all they are alike in one particular. They are all unnecessary and avoidable. Says the Safety Council: "If you use a home-made ladder make it safe. If you see a rung broken or ready to break, fix it or tell the foreman." It does not pay to take chances.

NEVER USE A LADDER LIKE THIS

Legal Department

RIGHT TO ROYALTIES UNDER CONTRACT—Where an owner of all the stock of a mining corporation, which had a five years' lease on certain coal property, transferred the stock in consideration of the payment of a tonnage royalty of seven cents on all coal mined under the lease, he was not entitled to royalties under a new lease granted at the expiration of the old one; the new lease not being intended as an extension of the old one. (Lathrop vs. Clemow, 68 Pennsylvania Superior Court Reports, 116.)

ADVERSE POSSESSION OF COAL IN PLACE—One who takes a deed to the surface of land with notice that the underlying minerals have been conveyed to another can acquire no adverse possession to the minerals by reason of his occupancy of the surface under claim of ownership. Adverse possession of underlying minerals can be initiated only by working them or by exercising some other act of dominion manifesting a purpose to claim them. (United States Circuit Court of Appeals, Fourth Circuit; Midkiff vs. Colton; 252 Federal Reporter, 420.)

OPERATOR NOT LIABLE FOR MINE FOREMAN'S NEGLIGENCE—No recovery can be had against a Pennsylvania operator for death of a miner attributed to neglect to provide him with an adequate supply of posts to prop roof, where it does not appear that the mine foreman ever ordered props from the superintendent that were not promptly furnished, or that the operator's attention was otherwise drawn to any shortage of props. In such case the operator is protected by the provisions of the statute which imposes upon the mine foreman the duty of directing and seeing "that every working place is properly secured by props or timbers," and of ordering the mine superintendent "to keep on hand at all times a sufficient quantity of materials and supplies required to preserve the health and safety of the employees." (Musin vs. Pryor Coal Co., 68 Pennsylvania Superior Court Reports, 88.)

Breaking of Cable in Protection Shaft

By Robert Dunn
Victoria, B. C.

SYNOPSIS—*A breaking rope in Protection shaft caused a heavy loss of life. What caused the cable to break? Tests conducted in Montreal would indicate that a lack of adequate lubrication, particularly in the hemp center, leaving the cable exposed to the attacks of water both from within and without, had much to do with the failure of the rope.*

WHAT was the caus of the breaking of the cable in Protection shaft, Canadian Western Fuel Co., Vancouver Island, B. C., on the 10th of last September, when 16 miners were hurled to death? Is it possible to adopt preventive measures that would make a repetition of such an accident impossible, except through non-compliance with regulations or carelessness in other respects?

These are two questions with which a coroner's jury holding an inquest into the deaths of the aforementioned coal miners at Nanaimo, B. C., are dealing. The inquiry is being thoroughly prosecuted as a result of the keen interest manifested by the Provincial Department of Mines. At the sitting on Dec. 16, William Fleet Robertson, Provincial Mineralogist, placed in evidence a report of investigations he had made at the laboratories of McGill University, Montreal. This document contains information of moment to all concerned in the use of wire cable in mining operations. The details given covering tests of the broken rope, and the conclusions reached, it is believed, will cause some radical changes to be made in present methods of inspection.

As to the cause of the accident under examination, Mr. Robertson's findings are contained, in summary form, in the following excerpt from his report:

The failure of the cable was, in my opinion, entirely due to the oxidizing of the wires, chiefly internally, caused by apparent lack of any internal lubrication, leaving the wires exposed to the action of a more than normally corrosive water and a humid atmosphere.

The hemp core, which under a sufficiently effective lubrication system would serve as a reservoir of oil to keep the wires oiled and protected from corrosion, not being supplied with oil, became a reservoir of moisture and so hastened the corrosion of the wires.

It is a well-known fact that if rust gets started in a steel structure such rust will continue despite any surface application of anything that may exclude the atmosphere.

Hence only a thorough soaking of the hemp core with oil before it is installed and a frequent renewal of the oil supply would be necessary to ward off corrosion.

The fact that the tests showed the cable to be more corroded in certain parts than in others, and these not in any regular procession, may be accounted for by local conditions in the shaft, of which I have no knowledge.

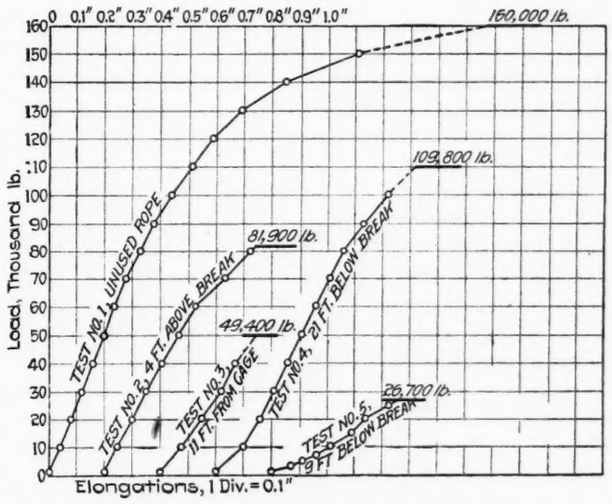
A reference to the sketch showing tests will show that the section of the cable about 4 or 5 ft. from the fracture broke under a load of a little over 13 tons, and it stands to reason that the rope at the fracture had a lesser strength.

The weight of the empty cage is given by the company as 4358 lb.; the rope, 179 ft., weighed about 540 lb.; sixteen men at an average of, say, 170 lb., 2720; making a known dead load of 7617 lb., or approximately 4 tons.

Mr. Robertson gives it as his understanding that the rope broke at a point which, at the time, was passing over the sheave and proceeds to say that "when a cable of this description passes over a 10-ft. sheave, it is by the bending subjected to an additional 9360 lb., or, say, roughly, 5 tons. This, in addition to the dead load as given above, would give a stress in cable, if traveling slowly, of approximately 9 tons, which approaches so near to the breaking stress shown in Test 5 (described hereinafter) that it is scarcely necessary to assume extraordinary rough handling by the hoistman to account for the break.

"As an indication that this sort of interior corrosion is not confined to the case in hand," Mr. Robertson produced "a piece of 1¼-in. cable from a Sudbury mine which was tested at McGill University in my presence. It broke at 58,600 lb., whereas the new cable had a breaking strength of about 128,000 lb. I think you will agree with me that this cable shows but little deterioration discernible, externally, whereas in the broken end, also exhibited, the internal corrosion is excessive."

Before proceeding to give details of the interesting experiments carried out at Montreal under Mr. Robert-


0 0.1" 0.2" 0.3" 0.4" 0.5" 0.6" 0.7" 0.8" 0.9" 1.0"
160,000 lb.
109,800 lb.
81,900 lb.
49,400 lb.
26,700 lb.
TEST NO. 1. UNUSED ROPE.
TEST NO. 2. 4 FT. ABOVE BREAK
TEST NO. 3. 11 FT. FROM CAGE
TEST NO. 4. 21 FT. BELOW BREAK
TEST NO. 5. 9 FT. BELOW BREAK
Load, Thousand lb.
Elongations, 1 Div. = 0.1"

GRAPHS OF THE PORTION OF THE CABLE TESTED

son's supervision, it should be explained that he was furnished at Nanaimo with all the faulty cable which, for convenience, is divided into three parts: (a) That part which was constantly on the hoisting drum in the engine room; (b) that 100 ft. including the upper end of the fracture and extending upward and (c) that 100 ft. including the lower end of the fracture and extending downward to the cage. He also had the spiral springs designed to bring the safety clutches into action, a jar of water collected as it fell in the Protection shaft, and a bottle of black oil of similar character to that used in lubricating the cable. His directions were

to submit these "exhibits" to "the most critical physical, chemical and microscopic tests practicable in Montreal," with a view, of course, to establishing definitely and beyond cavil the cause of the break.

The result of the tests to which the cable was subjected is graphically illustrated in the accompanying illustration. Of them Mr. Robertson says:

Test 1—This piece of cable [that taken from the drum] showed only very slight wear and only on the outer wires, possibly caused by pressure on the drum. The individual wires were bright and free from rust. The cable was practically as good as new, and had been lubricated, grease oozing out as the strain was applied. The test piece taken was approximately 36 in. between the grips. The load was applied in successive increments of 10,000 lb. each, the elongation of the specimen being taken for each increment.

The elongation for each 5-ton increment was 4/100 in. up to 70,000 lb., increasing gradually until at 120,000 lb. the elongation for the last increment was 8/100 in.—the total elongation under this load being 59/100 in. At almost 130,000 lb. the elastic limit of the cable seemed to be reached and the cable broke under a load of 160,000 lb., after sustaining such load for a minute or so, when three strands broke simultaneously a few inches below the upper grip.

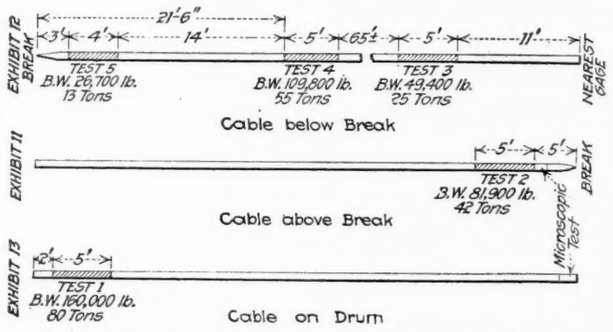
The pull being continued, the other three strands broke near the lower grip. The breaking strength of cable was 160,000 lb., or 80 short tons. As a check and confirmation of this test a 24-in. piece of cable adjoining the test piece was unwound—the individual wires somewhat straightened—and six of the larger wires and three of the smaller wires from each strand were submitted to a tensile breaking strain. These wires showed remarkable similarity in strength. The wires of average diameter of 0.1255 in. had an average strength of 2540 lb.; the wires of average diameter of 0.085 in. had an average of 1165 lb.

The aggregate strength of all the wires comprising the cable, if pulled straight, would be 179,100 lb. The strength of the cable, therefore, was about 89.35 per cent. of the strength of the aggregate of the wires, a result considered as indicating a well built cable. The tensile strength of the steel in the wires would be equivalent to about 208,000 lb. to the square inch. This result, taken with the uniformity in strength of wires, indicates an excellent quality of steel in the cable.

Test 2—This was conducted on sections of cable immediately above the fracture. The test piece was cut starting about 5 ft. above the tapered end of the fractured cable. The exterior showed a certain amount of wear on the outer wires but not at all serious. No broken or torn wire ends were observed on the surface in the whole length of the piece. A serious amount of rust was observable on surface wires. In opening up the end of the test piece, in preparing it for the grip, the small interior wires were found to be badly rusted and eaten away, so much so that several of them were found to be completely eaten through. None of the larger (0.1255 in. diameter) outer wires were eaten through—but they also were badly corroded—a rough estimate being that the steel in these wires had about half the sectional area of similar wires in Exhibit 13 [the good rope].

The cable and the core showed no indications of having been lubricated—both were dry and dusty. This test piece [tested similarly to the former] showed very even elongation for each successive increment of 5 tons in load—up to 60,000 lb.—at about which point the elastic limit seemed to be reached. Under a load of 81,900 lb. four strands of the rope broke, the break extending 12 in. below the grip. In breaking clouds of dust were given off, the doors of the building having to be opened to clear the air, indicating the interior to be very dry, with no indications of having been oiled. The two remaining strands broke under load of 21,000 pounds.

Test 3—This and the following two tests were made on three separate pieces of the rope from the fracture down toward the cage. The test under consideration was of a piece cut 11 ft. from the end nearest to the cage. It was seemingly uninjured by its fall with the cage. It was not untwisted at all and there were no projecting or loose wires on the surface. The surface was somewhat worn and was corroded to at least half



WHERE TEST PIECES OF THE CABLE WERE SECURED

section of the externally visible wires. In the portion opened for the grip several of the small wires were found to be corroded completely through, as were a few of the larger wires. The load was applied as in previous tests. With each 10,000 lb. increment of load the elongation was practically constant up to 40,000 lb., being about 0.07 in. for each increment. At about 40,000 lb. certain of the interior wires were heard to break. At 49,400 lb. the cable broke at about 3 in. below the upper grip. The center core was absolutely dry and dusty, and large quantities of rust dust were given off in breaking.

Test 4—This test piece was cut 21 ft. 6 in. below the fracture. The cable showed but slight wear, but was much corroded both on surface and interior wires, but as far as could be seen few if any of the wires were actually eaten through. No evidence of lubrication was visible in the interior of the cable. This piece was tested as were the former. The elongation for each 10,000 lb. increment was constant at about 5/100 in. up to 80,000 lb., which was about the elastic limit. Under a load of 106,000 lb. some of the interior wires were heard to break. At 109,800 lb. the cable broke, two strands parting about 6 in. below the upper grip. Subsequently the remaining strands were broken by reapplication of the load. The third strand broke under a load of 55,000 lb.; the fourth under a load of 55,400 lb. and the fifth and sixth under a load of 43,700 lb. Three strands broke near each end of the test piece.

Test 5—This piece was cut at 3 ft. below the point

of break. It did not appear to be damaged by the fall. The rope was still tightly twisted and but slightly bent, not enough to materially affect it. This piece was badly corroded, so much so that even on the surface a number of the wires were seen to be completely eaten through and could be picked out with the fingers; but none of the ends projected. In the interior of the cable one of the sub-strands was completely cut through by erosion. There was no indication that the rope had even seen oil.

The condition of the test piece was evidently so bad that the load was applied in smaller increments than in other tests. At 2600 lb. load wires were heard to break in the interior. The successive loads applied were 3000, 5000, 7000 and 10,000 (when elastic limit was reached), 20,000 and 25,000 lb. At 19,500 lb. a number of wires were heard to break and at 22,000 lb. more wires broke. At 26,700 lb. load three strands parted 12 in. below the grip. Three remaining strands broke at 8800 pounds.

The cable in question had been in use for three years. It is described as being originally a first-class cable in every particular, well made and of excellent material, of Lang's lay build and apparently up to specifications.

The amount of rust visible on the surface was serious and showed when the cable was dry, but if the cable as it hung in the shaft was dirty, an inspection by passing the rope through the hand or against a stick would fail to reveal the defect in the rope.

In a shaft where the cable was subjected to heavy and constant work, the wear on the external wires would probably be so great as to wear certain strands through, thus producing projecting ends; and these would be the first indications of deterioration of such a cable. The hand test might then be of value. But in the Protection Island shaft the mechanical wear on the cable was slight, the failure being internal, hence not discernible by the method of inspection in vogue.

Concerning the spiral springs designed to bring the safety clutches into operation these were of excellent quality, capable of a safe extension of about 30 per cent. of their length and having a pulling power when so extended of about 1250 lb. It may be observed here that tests since made at the Canadian Western Fuel Co.'s yards at Nanaimo have demonstrated that such springs and clutches do not give satisfaction on a descending cage, although brought into successful operation on an ascending cage suddenly released.

The oil used in lubrication is declared to have been of a character non-injurious to the steel. Concerning the water, Mr. Robertson says: "There was no free acid in the water that would dissolve the steel, but the water was of such composition as to rust the steel more rapidly than pure water would. It would also be apt to wash off any external lubrication of cable faster than would pure water."

[No verdict had been reached by the coroner's jury at the time the foregoing article was written, and as a matter of record the subsequent findings of the jury empanelled to inquire into the cause of the death of the 16 coal miners is given herewith: "We [the jury] find that the said men came to their death by descending on a defective cable, which broke, owing entirely to the oxidizing of the wires, chiefly caused by apparent absolute lack of any internal lubrication, leaving the wires thus exposed to the action of a more than normally corrosive water and a humid atmosphere." The jury recommended the appointment of an expert inspector of hoisting ropes, cages, safety catches, etc., and that legislation be enacted whereby under such abnormal conditions as obtained in the Protection shaft no new hoisting cable be retained in service longer than some reasonable time to be determined by the Department of Mines.—EDITOR.]

Mine Section Insulator with a Switch

In mines every cross-entry should have a section insulator placed in the trolley wire on the tangent as close as possible to the main entry. As most cross-entry trolley wires are used only a part of the time it would increase safety if current were cut off from it when it is not in use.

A common practice is to use a section insulator similar to that shown in the accompanying illustration. With certain types of section insulator having no switch attachment it is necessary to have a knife-switch connected in the circuit so that the cross-entry trolley wire can be energized. Such a knife-switch should be mounted in a box to protect it from moisture and dust.

It will readily be seen that this arrangement requires a considerable amount of labor and material. It also has other disadvantages, as the locomotive may get stalled with the trolley wheel on the insulated part of the section insulator while pulling a load. Considerable delay will be experienced in such a case unless there is insufficient room to turn the trolley pole. It is often necessary to detach several cars in order to enable the locomotive to pass the dead section in the trolley.

A section insulator should not permit of any leakage whatever if the switch is open. Its construction, as a whole, should be mechanically strong, yet not so heavy as to add unnecessary weight in case the local conditions are such that it cannot be supported direct from the mine roof. Two supporting lugs with longitudinal adjustment are preferable. Where conditions do not permit of using two supports and space is limited, a swivel boss in the center is highly desirable. The runner of the switch should never obstruct the passage of the trolley wheel, regardless of whether the switch is open or closed.

COMBINATION SECTION INSULATOR AND SWITCH

A metallic runner with air insulation has several advantages. It allows uniform wearing and no parts require renewal. Where treated wood or fiber is used considerable arcing when breaking the circuit takes place. This eventually increases to such an extent that the runner parts have to be replaced quite frequently.

The switch should be independent from the runner and of such section that it will permit a heavy current to be carried without heating the section insulator at any point, as this may damage the insulating qualities of the device.

Direction of current flow in a mine varies and a switch should be made so that it can be opened either right or left hand. The illustration shows a switch that can easily be changed from a right- to left-hand throw by loosening up the machine bolts and interchanging the break jaws with the hinge jaws. Changes of this nature can be made in the mine quite easily. When the switch is open, the break jaw should always be the live terminal. This can be accomplished by interchanging the hinge and break jaws as mentioned above.

The Mindanao Coal Mines

By Monroe Woolley
San Francisco, Cal.

SYNOPSIS — *The Philippines are rich in coal but Mindanao appears to have more extensive fuel deposits than the other islands of the group. These deposits are not now worked to any great extent, but it is hoped that ere long native coal will replace Japanese fuel at Manila and other ports of call for steamers following the routes of world commerce.*

AN AMERICAN mining engineer who has had much experience in China and other Far Eastern countries, after making an extensive investigation of the coal fields in Mindanao, Philippine Islands, pronounced the deposits the greatest in Asia. This means not only a great deal to Philippine industry, but to the world at large, particularly to the United States.

Perhaps the most extensive deposits so far known in Mindanao are located on the Sibuguey peninsula. The National Coal Co. has recently finished an exhaustive survey of these rich fields and is now rapidly preparing to develop its holdings there. The Philippine insular government holds 51 per cent. of the stock in this company. The peninsula contains about 100 square miles of surface underlaid with rich deposits of coal.

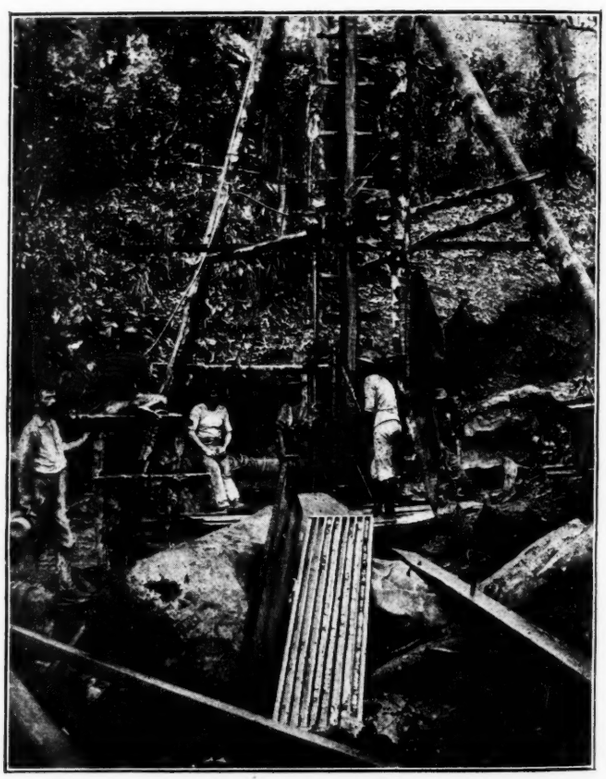
The National Coal Co. is confining its present activities to a tract about 10 miles in extent that is especially rich and the product of which can be marketed at a minimum cost. This tract lies inland from Taba Bay and is not far from the Sibuguey River. For eight months of the year this stream is navigable as far as the coal fields, and until the company sees fit to put in its own transportation lines the river will be used for getting the output to market.

Preliminary to development on a larger scale the company is putting out something like 100 tons per day. Before it can materially add to its output from its holdings the company will be compelled to import a considerable amount of machinery from the United States, especially railroad material to get the coal to the coast ports, as well as mining machinery to get it out of the ground. It is known that the river cannot be relied upon continuously, as it is navigable only for a portion of the year. Furthermore, it is remote from the outlying fields belonging to the company. Hence, when development reaches a more extensive scale, as it soon will, railroads must supersede the stream. The company has already bought considerable second-hand equipment from the railroad companies in the islands, such as engines, boilers, pumps and some other apparatus.

The preliminary surveys of the Mindanao fields show considerable amounts of anthracite, especially at the northern end of the National Coal Co.'s tract. Here a bed of this coal 13 ft. thick has been uncovered. But as the islands have no use for anthracite, at the present time, no effort will be made just now to mine this fuel.

Near the middle of the National company's tract there is an excellent vein of bituminous 6 ft. thick. Experiments with this product show the coal to be a good coking quality. It has tested out far ahead of the Japanese coal long imported into the Philippines. There has also been discovered a bed of non-coking soft coal that appears to be about 6 ft. thick and of considerable extent.

Mindanao is said by soldiers who have served there and who have traveled widely over the island to be a veritable mine of coal. In many remote places, almost wholly unvisited by white men, coal is said to crop out of the earth everywhere, and no doubt Mr. Bryan, when he was advocating the retention of Mindanao as a coaling station, in event the Filipinos were given their independence, was aware of this mineral wealth.



DIAMOND DRILL AT BATAN COAL MINE

A new bed of good steaming coal has been discovered in Albay Province, southern Luzon. A company is preparing to invest $150,000 in modern mining machinery. Vicente Mardigal & Co., the largest coal dealers in Manila, are said to have made an offer to the promotors of this new field for their interests, but it is believed that whatever operations take place will be under the direction of the National Coal Co., as provided by Philippine laws.

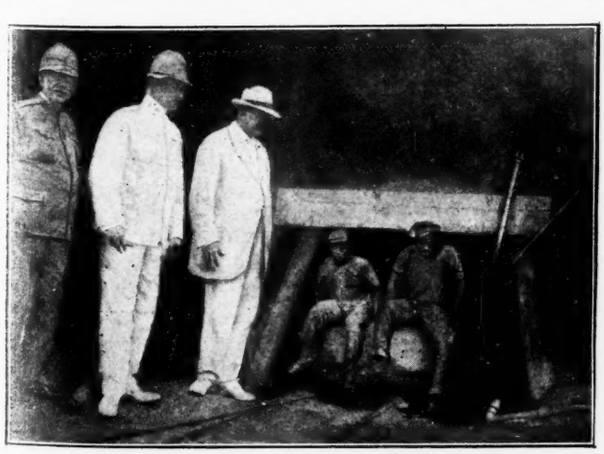
The government tried to mine coal from the Batan Island fields in the Gulf of Albay some years ago, but the earlier operations failed. The mines had to be abandoned because it was claimed the formations found would not resist the water pressure, and the mines could not be sufficiently timbered to permit of operation. The new bed is said to be on a higher elevation and is protected from water by a rock formation. The fact that this is absent in most coal regions of the Philippines has already kept several projects of good promise from development.

At present there are two coal mines being operated on the Island of Cebu. One is at Uling, south of Cebu City, and the other at Banao, to the north. At each of these places it is reported that the output is about 30 tons per day and all of the coal mined is readily disposed of. Mr. Betts, who was formerly American governor of Albay Province, is operating a mine near the old government project on the Island of Batan, near the port of Legaspi in the Gulf of Albay. The output of the Betts mine is only about 25 tons daily and the Manila R.R.'s Legaspi line consumes the entire output.

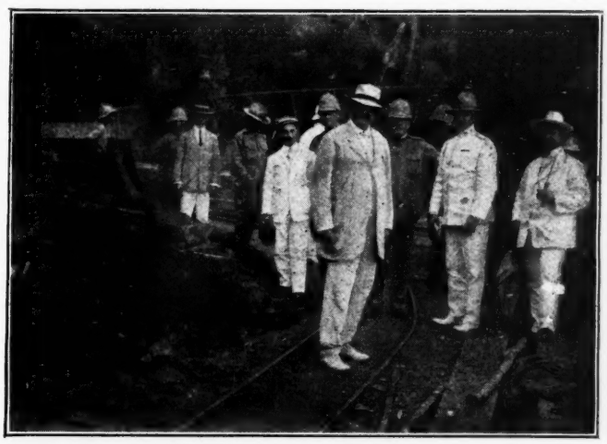
A corporation with a capital of half a million pesos (a quarter of a million dollars), has been organized in Iloilo, capital of Panay, for the purpose of mining coal at Escalante, on the Island of Occidental Negros. This organization is known as the Negros Coal Co. This company at last report had not yet produced coal, but was preparing to do so.

It is a lamentable fact that although the entire Philippine archipelago, particularly Mindanao, is rich in coal deposits, it has, nevertheless, always been necessary to import coal from Japan or China. The American army transport service has always had to make Nagasaki a port of call for coal, and these ships are kept busy carrying coal for their own use back and forth between Nagasaki and Honolulu. Besides, the Philippine government, and many commercial concerns in the islands, import thousands of tons annually from Japan, when, as a matter of fact, there is literally "coal to burn" right in the Filipino's back yard.

The Filipino has the biggest coal fields in Asia, but he has been a long time finding it out; and when he did discover the great truth he was not as energetic in developing his natural wealth as he might have been. Yet it is not altogether the fault of native capitalists that the Philippine fields have for so long been neglected. The government, too, is in great measure liable for much of the blame.



MOUTH OF THE SLOPE AT THE BATAN COAL MINE



NO PRETENTIOUS SURFACE EQUIPMENT HERE

The Philippine government until lately denied foreign capital the right to do much development of natural resources, fearing that the rights of the natives would be usurped. The natives themselves not only lacked initiative, but what was worse they lacked the money to do things on a big scale. Furthermore, the Filipinos of the past generation knew as much about mining as a society matron knows about cooking; but now a liberal educational system inaugurated in the islands has turned out not a few native mining experts, and, as the Philippines have grown rich through world-war trade, there is no reason now why the extensive coal fields of the islands should not be rapidly and permanently developed. And it is gratifying to note that many of the promoters, in fact the majority, are Filipinos.

Coal is not used in the Philippines in households. The climate is tropical and such fuel is unsuited to the cooking methods employed, while of course house-heating apparatus is not used. But countless ships traversing world routes will call at Manila for coal once the Philippine mines get going in good shape. For many years the Japanese mines have held monopoly of all the coal business in that part of the world, notwithstanding the fact that the mines of China have been worked, after a fashion, for centuries. Both the United States and the Philippine governments will gain huge sums annually when sufficient coal is produced in the islands to meet the needs of the governments in operation there. The coal bill of the army transport service alone now reaches into the hundreds of thousands of dollars yearly.

IN A COMPETITIVE MARKET the impurities in steam coal are severely criticized by consumers. It is not difficult for a competent fireman to maintain steam under certain conditions when these impurities do not exceed 20 per cent. Coal which contains from 20 to 30 per cent. of impurities is frequently burned at the mines; however, as a rule it would be unprofitable to ship this product any distance. It should be burned close to the point of production. Transportation charges are a serious obstacle to the movement of coal containing 30 per cent. or more of impurities. Recently, all steam coal containing 20 per cent. or more of impurities was condemned by the Fuel Administration when it came under its observation.

Replies to Attack on Anthracite Coal Industry

S. D. Warriner, president of the Lehigh Coal & Navigation Co., one of the eight anthracite companies alleged by Senator Vardaman, of Mississippi, to constitute a monopoly of the anthracite business to the detriment of individual operators, on Mar. 4 issued a statement on points covered in the Vardaman statement. The Mississippi Senator, who retired from Congress on Mar. 4, made his address in the Senate as chairman of the Senate Manufactures Committee, which has been taking testimony on the anthracite situation, but which has not made any complete report. Said Mr. Warriner:

Senator Vardaman's remarks in no way bear out the testimony taken before the committee and the fact that the report was signed only by him clearly indicates that it does not represent the views of the other members of the committee. He speaks of a monopoly comprising eight companies. There was no evidence adduced to indicate any concerted action by these companies.

"Shortage of anthracite and high prices, due to monopolistic control," to use the Senator's reported language, are purely imaginary conditions. In the calendar year 1917 the total anthracite production was almost 100,000,000 net tons, the highest output ever reached, while for the calendar year 1918, with a decrease of 4000 employees and a most serious influenza epidemic, the output was within 200,000 net tons of the 1917 figure. The fact that output per employee per year rose from 548 tons in 1916 to 646 tons in 1917 and to 662 tons in 1918, should prove that neither employers nor employees spared any effort or labor to meet public needs.

Existing coal prices at the mines, and these are the only prices with which the operator has to do, have been set by Federal authority, and it is a matter of common knowledge, as well as a fact of public record, that the so-called railroad coal companies during the period of Fuel Administration control were selling coal at 75c. a ton less than the price obtained by the so-called individuals. Under the Lever act, prices fixed for coal were supposed to carry a fair margin for the producers, but Dr. Garfield himself, in his statement lifting all restrictions on anthracite Feb. 1, said that owing to general increases in the prices of labor and materials, the cost of mining anthracite had risen to such an extent that some producers, including so-called railroad interests, were mining at a "cost which resulted in many instances in a loss." Dr. Garfield added that, had he retained control, he would have found it necessary, on the basis of a Federal cost examination, to have raised maximum coal prices as much as 50c. a ton.

Anthracite, even on the basis of today's prices, has advanced less than half a hundred other commodities, in everyday use, when compared with the pre-war basis. Shoes, flour, textiles and many foodstuffs have doubled and even trebled in price, according to figures gathered and published by the Government, while the advance in anthracite has been far below those figures.

So far as freight rates and demurrage charges go, they are being applied by the United States Government through the Railroad Administration, and are matters with which the railroads, as such, have nothing to do, save enforce. Prior to the rule of the Railroad Administration, the established practices, including demurrage, storage facilities and interstate freight rates, were those fixed by the Interstate Commerce Commission.

It is perfectly true that there are coal interests which are affiliated with carrying companies, and it is correct that the Pennsylvania Constitution of 1874 forbids transportation companies to engage in mining. But it must be remembered that companies like the Lehigh Coal and Navigation Co., and others, hold their powers under charters granted long before the Constitution of 1874 was adopted and exercise specifically granted rights.

There is no policy of withholding land leases from independent operators. Senator Vardaman himself heard testimony in Pottsville on that point, where it was specifically stated by witnesses that they had been able to lease without difficulty or that, when a lease was refused, it was because another mine was working into the desired land.

Senator Vardaman, the printed reports indicate, did not mention the fact, also testified to in his presence, that the labor cost alone represents about 60 per cent. of the cost of anthracite on board at the mine, for labor is now receiving about four times as much as in 1901. This testimony is not only on the minutes of the committee, but similar testimony is available in the reports of the Fuel Administration engineers, made to Dr. Garfield.

The possibilities of reclaiming fuel from the culm banks, mentioned by Senator Vardaman, have been greatly overdrawn. In many of these banks there is much fuel, but it is almost entirely small sizes—pea coal and under. During the heavy war demand for coal domestic sizes were chiefly needed. To get this tonnage it was necessary to mine coal. The fact that with 176,552 employees in 1915 the hard coal mines produced 88,995,000 net tons, while with 150,245 employees in 1918 they produced 99,472,800 net tons, is a conclusive answer to any question involving the wisdom and practicability of the policy employed by the anthracite industry during the period of the war.

Failure of Sundry Civil Bill Works Out to Advantage of Fuel Administration

Failure of the sundry civil bill has left many of the Government bureaus in a state of uncertainty with regard to the appropriations which they will have for the next fiscal year. This is not the case with the Fuel Administration, however. The bill proposed to take away practically all of that organization's surplus. Failure of the measure, however, has left at the Fuel Administration's disposal some $750,000, which will provide for the closing of the Administration's affairs and

the compilation of its records without the exercise of parsimony. Of course, the bulk of that sum will be turned back into the Treasury voluntarily. The turn affairs have taken as a result of the failure of the bill is very gratifying to Fuel Administration officials, as the proposed action of Congress would have left them with insufficient funds to draw conclusions from their records, thereby making available to the industry statistics of great value.

Ohio Valley Operators Gain Decision in Important Traffic Case

In the important traffic case of the Ohio Valley Coal Operators' Association versus the Louisville & Nashville R.R., the Interstate Commerce Commission holds that the rates from mines in western Kentucky on the Louisville & Nashville Railroad to Cincinnati, Ohio, are and for the future will be unduly prejudicial to the extent they exceed or may exceed the rates from mines on the Louisville & Nashville R.R. in the Jellico-Middlesboro group in eastern Kentucky and Tennessee by more than 15c. per net ton.

The operators claim that Cincinnati is a natural market for western Kentucky coals and that the experience during the war has shown that it has given general satisfaction in that market. Their plea was for an adjustment of railroad rates so that their product might enter Cincinnati in normal times.

On the other hand, the railroad claims that the movement of coal in western Kentucky is much disjointed and requires an unusual amount of terminal and branch line service. The railroad also features the fact that the haul to Cincinnati must be accomplished against excessive grades. The railroad also declares that the character and grade of western Kentucky coal prevents its successful competition with other coals in the Cincinnati market. It was claimed that the western Kentucky coal was surrounded on all sides by superior coals mined in Indiana, Illinois, eastern Kentucky, Georgia and Alabama. In addition, it has to compete with water-borne coal from Pennsylvania and West Virginia. On these premises was based the conclusion by the railroad that the extensive use of western Kentucky coal during the war was due to the inability to secure the other coals. The commission held, however, that the weight of the evidence to that effect did not support the conclusion.

To Break Up Practice of Unfair Rejection of Coal Consignments

Plans are being considered by the National Coal Association, the American Wholesale Coal Association and the retailers' association to eliminate losses from the unfair rejection of consignments of coal. It is expected that the country will be divided into merchant centers, in which inspectors will be stationed to investigate the cause when shipments are rejected. When it is established that the consignee has unfairly declined to receive a shipment, it is the intention to have him placed on the cash list in the future. The operators and the wholesalers state that they are prepared to make determined efforts to break up the increasing tendency to turn back coal when changing conditions make it to the interest of the purchaser to do so.

Conflict of Opinion Regarding Percentage of Coal Lost in Transit

Conferences with the freight claim agents of the railroads have developed that the retailers are unwilling to allow any difference in weight of the car of coal at the time of its receipt by the railroad company and at the time of its delivery. The American Wholesale Coal Association is willing to disregard losses of 1 per cent. or less, but if the loss in transit is more than 1 per cent. it demands the full face of the claim. The Railroad Administration insists on a 1 per cent. variation in scale weights and 1 per cent. tolerance for evaporation. The National Coal Association has attempted to prove that absorption will balance evaporation, but has made no demands as to exact percentage of allowance.

An effort to harmonize the conflicting views will be made at another conference to be held the last week in March.

The secretary of the American Wholesale Coal Association is recommending that the wholesalers take the fight in their own hands by buying at the mine weight and selling at the delivered weight. The matter of recovery then would be entirely between the railroads and the wholesalers.

Important to Know Why Mines Suspend

Difficulty is being experienced by the statistical division of the Fuel Administration in obtaining information as to the closing of mines. As long as mines continue to operate, most of them are prompt in sending in returns; but when the operation is closed down no further report is forthcoming. It is essential in the compilation of the statistics, designed to help the industry, to know of each cessation of operation and the cause therefor.

Demurrage Rules Upheld on Lake Coal

Demurrage rules enforced in 1915 and 1916 by the Cincinnati, Hamilton & Dayton Ry. on Lake cargo coal have been upheld by the Interstate Commerce Commission. They had been attacked by the Cabin Creek Consolidated Coal Co. The Cabin Creek company, along with other shippers over the Cincinnati, Hamilton & Dayton, declared that five days is an insufficient free-time allowance to permit the accumulation of a cargo. The Commission does not agree and cites the fact that "the Pennsylvania company reports an average detention for all lake ports which it serves of 4.53 days in 1915 and 3.52 days in 1916. The average detention shown by the Toledo & Ohio Central R.R. at Toledo was 4.04 days in 1915 and 4.25 days in 1916; by the Hocking Valley Ry. at Toledo, 3.68 days in 1915 and 2.98 days in 1916; and by the Baltimore & Ohio R.R. at all ports, including the Cincinnati, Hamilton & Dayton R.R. at Toledo, 4.55 days in 1915 and 3.69 days in 1916."

A large number of gas masks, which originally were intended for army use, have come into the possession of concerns who are circularizing the mining industry and fire departments. In view of this fact the Bureau of Mines has issued a second warning against the use of army masks for industrial purposes.

EDITORIALS

Is the Business Man the Only Visionary?

THE convention of governors and mayors called by President Wilson passed a resolution thus worded: "We recommend to the states that they consider means of releasing natural resources from controllers who wilfully withhold such natural resources out of use for speculative profits or for visionary future development; thus contributing to unemployment." As this is addressed to states, evidently no reference is made to the Federal Government; but when reading about "controllers who wilfully withhold natural resources out of use for speculative profits or for visionary future development," one's mind naturally reverts to the Federal authorities who have placed such a high value on coal that it is not being purchased and operated. It is the bureaus of the Government which seek—for the Government, it is true—speculative profits and which have visions of excessively profitable future development. That being the case, why call the governors and mayors and why neglect to call the duly appointed constitutional authorities who have power over Federal matters—to wit, the members of Congress? But for certain unspecified but generally known reasons they have not been called.

The output of ten months in the anthracite fields is not enough to provide for domestic consumption in a year containing a normal number of cold days. As demand is closing the mines, it is quite possible that next winter there will be a coal shortage. The argument is: "Buy now" while anthracite is still down at that low-price level where a frugal, if not fair, Fuel Administration placed it. Later there will be a higher price and a difficulty in securing coal even at that figure. If a consumer will not spread his orders through the year he may expect to go short when the chilly days of 1920 *arrive.*

After the Manner of His Kind

AS WAS to be expected, the flood of destructive criticism indulged in by some of our law-givers at Washington has once more turned to the anthracite coal trade. Senator Vardaman, of Mississippi, chairman of the Manufacturers' Committee of the Senate, who recently conducted an investigation of the cost of producing anthracite, broke loose in the Senate last week with the usual stock phrases condemning the larger anthracite interests, with a few new twists evidently added for variety's sake.

It is hard to understand the motive of Mr. Vardaman, inasmuch as the statements which he made in the closing days of the last Congress were entirely at variance with the evidence as adduced before his committee. Inasmuch as his term of office expired with the expiration of this session of Congress, it may be his swan-song was attuned for home consumption with the hope of a successful come-back soon as an ardent supporter and tribune of the "rights of his dear peepul."

The statement that production had been curtailed during the war on account of the unwillingness of the big companies to develop virgin tracts is foolish on its very face. The facts are that in 1917 a record production of anthracite was made, and this again was almost equaled in 1918. With a shortage of about 30 per cent. in the labor force during both 1917 and 1918, it can be seen what a ridiculous figure the Senator has made of himself. The unfortunate part of the report is that it will be implicitly believed by the great bulk of the people, who have no desire to learn the true facts but are ever willing to believe that an advantage is being taken of them in the price of coal.

There can be no denying that evils at times creep into all big business institutions, and in this the coal trade is not alone. As we see it, one of the best things that could happen to the anthracite trade would be some arrangement whereby the independent operators in times of a flat market, as at the present time, might have the advantage of the storage yards maintained by the larger companies. To have made this statement a few years ago would have been to invite ridicule.

However, since the successful operation of the bituminous pools at seaboard under the auspices of the late Fuel Administration, it would seem entirely feasible for an arrangement of a similar kind to be made in regard to the anthracite storage yards. Such a plan would redound to the benefit of both large and small shippers. For one thing, it would stabilize the prices of coal and prevent its sale by individual shippers at less than the cost of production; further, it would release cars for the carriage of other merchandise and save the heavy demurrage charges which inevitably accumulate on shipments of coal that cannot find a market.

Probably the coal man will be most interested by that statement of Senator Vardaman which urged that the price of coal "be fixed by the Government at a rate which would guarantee a fair return to the mining companies and which would vouchsafe to the people of America an ample supply of anthracite at a reasonable price." That is just the problem the producers of anthracite are wrestling with at this moment. When all at interest can agree what is a "fair return" and a "reasonable price," the millennium will not be here exactly, but it will surely be just around the corner.

It would be pleasant, though futile, to endeavor to believe that in his attack on the practices and prices in the anthracite industry Senator Vardaman was free from a desire to play politics. It would be consoling if we could conclude that, after all, the only reason why his criticism was wide of the mark was because he, like the storied shoemaker who left his last to criticize details not pertaining to his craft, was trying to direct something of which he had no knowledge.

Unfortunately, when we try our hand at excusing, we remember that Vardaman comes from Mississippi, where cotton, which during the war was perhaps even

shorter in supply than coal, remained entirely unregulated and commanded a fabulous price. The senator, enraged at the coal situation, and loudly condemnatory of Government prices, was entirely unmoved by the more grievous cotton situation out of which his constituents were becoming wealthy.

He surely had every reason to believe that the cotton trust was unscrupulous. Had it not combined to raise the price of cotton? and had not the cotton planters in some years even threatened to burn some of the staple which had already been harvested? The senator hypocritically flagellates those who lost money and defends those who made it; he condemns those who have been selling at a loss and leaves without criticism those who profiteer; and he speaks still kindly to those who would burn what they have produced so as to raise prices unduly. Men like the Senator raise grave questions as to the soundness of democracy.

Third Liberty Bonds are yielding at present prices 4.85 per cent. They are the safest of investments, shrinking less than almost any others and sure eventually to sell at large profit. It is a patriotic and profitable duty to buy them and any other Liberty Bonds, new or old, and to keep them if possible when bought until they sell at a price above par. If a bond issue is not floated this spring there will be an excellent opportunity for the operator or wage earner who is able to make savings, to place those savings in old Liberty Bonds, where they will be safe and profitably invested and where they will perform a patriotic service.

Surely in This They Rob Us

SENATOR VARDAMAN, by much patience, has discovered that the anthracite-producing companies are few in number and large. True enough. But what of it? Their prices satisfied the Fuel Administration, and now many of them are selling coal at less than cost. Those who would have everything sold at or below cost should be pleased that there are companies, however large, which will be so accommodating, though surely all of us will realize that the condition cannot last and would not be for the good of anyone if it did.

To work without profit is to put nothing aside, and to put nothing aside is the height of infrugality. To live beyond one's income, as many anthracite companies are doing, is even more to be reprobated. If every person and company expended more than they received then the nation would be impoverished. Surely when the anthracite coal companies sell coal at a loss they rob us, for they are a part of us; and if they waste their resources they reduce the wealth of the nation.

Let us never believe, as some do, that unprofitable industry is fruitful for the nation. Those uncharitable people who go out into their neighbor's fields and wish them a poor crop and a wet harvest are wishing themselves bad luck. When they invite a malediction of Providence on the farmer they are banning themselves as well as the toiler in the furrows. So also do we seek for ourselves an ill when we desire the manufacturer to put out his goods or the operator to sell his coal at a loss, for a loss to one is a loss to all.

But anthracite coal, we say, is selling at a high price. That is true, as compared with former costs. As compared with other articles, as compared with wages and cost of materials, as compared with the average power of purchase and as compared with the price that will have to be paid if the industry is to continue to supply our needs, anthracite coal is not expensive today but unduly cheap, Senator Vardaman to the contrary.

Let every state beware of becoming only a raw-material state. Some states with great opportunities finish nothing, yet begin everything. They ship the raw materials out and ship manufactured articles in, whereas they could fashion the materials and assemble the fashioned parts in their own back yards. West Virginia is an example of a state which performs only the simplest of operations, making little coke, no near-coke, only a small amount of electric power, and no byproducts. It should use more of its coal within its own borders and save the wastes and costs of transportation. Having no iron deposits it cannot, of course, be as self-contained as Pennsylvania could be but is not.

Is the Pyrite in Coal Intrinsic?

SOME recognition is being given at last to the idea that the pyrite in coal is organic and intrinsic. In an article appearing in "The Resources of Tennessee," entitled "Coal Pyrite Resources of Tennessee," by E. A. Holbrook and Wilbur A. Nelson, the authors say: "Because coal in a mine contains pyrite balls, or bands, does not mean that the coal from this mine is high in sulphur or inferior in quality; for often the contrary is true, that the sulphur, having concentrated into definite balls, or bands, leaves the coal comparatively free of sulphur."

It is likely that the sulphur in coal will eventually be found to be but rarely of an outside origin, though it is not safe to assume at the present stage that this is true of all of it. The "sulphur balls," as they are called, may well be considered, as to the authors just quoted allege, signs of desulphurization of the coal. It will be interesting to learn some day what wonderful plant in the ancient days secreted so much sulphur. It must have been as full of odor as the leek or the onion —and as greatly tear-provoking. Some of the coal forests must have been thickly bespread with it. True sulphur appears in concentration, the volatile matters having been removed; but with all allowances and every imagination, how can we explain beds which carry 6 per cent. of sulphur, and even more, in the general run of the coal?

Quite wisely the Government has reopened the opportunity for converting the first and second series of Liberty Bonds into bonds which pay not 3½ or 4 per cent., but 4¼ per cent. This is the conversion privilege which was kept open till Nov. 9 of last year and then closed indefinitely. Now it is opened, the operator should induce his men to avert themselves of the renewed opportunity for exchange. Second, Fours have been selling at a lower figure than the Second Converted Fours, and conversion is the best practice for every one including the mine worker. The most profitable course with First 3½ Liberty Bonds is to sell them on the market and buy a 4¼ issue, putting the difference in the bank.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

Mine workers in Illinois are somewhat generally demanding the shorter day, being led in that demand by the president of their branch of the union, Frank Farrington. They argue that shorter hours would keep every one working an equal length of time throughout the industry regardless of the quality of the coal worked. They want the worst coal of Illinois, Iowa and Indiana to be mined as steadily as the best in Pennsylvania and West Virginia. The consumer might well not be pleased with such an outcome of union activity, but that is not the worst objection to Mr. Farrington's proposal.

Should we place the industry on a six-hour basis, if only for a few months, the mine workers would be disposed to try to keep it there. When there would again be a big demand for coal it would be impossible to secure it working on a six-hour basis. As a result there would be another coal shortage and more working men would flock to the industry, in fact they might come before that auspicuous hour. The last state of the industry would then be worse than the first. The flood of men would seem to make it necessary to make a four-hour day when business became slack. More men would enter the mines, and at the next business flood, still more men would be engaged. A three-hour or a two-hour day would be proposed and so on indefinitely.

We should thus have an infinite series of decreasing terms ending in zero. If the Farrington cure for slackness is to be taken at every decline in business, a long-time invigorator should be swallowed whenever business briskened. The reason why the mines are flooded with men is because the regular mine workers did not meet the demand when it came. This, of course, they cannot deny. They will say, however, and say with truth, that a very important reason for not meeting that demand was the loss of the working force due to the absence of men in the Army and munition works.

Farrington has more excuse than the British advocates of shorter time. In Great Britain there is an acute shortage of coal and of working places. No more than a certain number of men can be employed, but each man should get out his utmost in order to meet the emergency. The short day will not serve in Great Britain even during slackness of employment, whereas it might conceivably do little harm here if the mine worker realized it as only a temporary expedient. Everyone who knows the mine worker well knows he would not so regard it but would want to keep his six-hour day and twelve-hour pay indefinitely.

Want Larger Accident Compensation

The presidents of all the five districts that have been established by the United Workers of America in Pennsylvania recently held a meeting with Harry A. Mackey, chairman of the compensation board, and Francis H. Bohlen, the counsel for the board, and discussed with them amendments to the compensation law. The revision of the law thus proposed would raise the compensation, reduce the waiting period after which compensation is paid, provide compensation for disfigurement, eliminate the section providing for the proving of dependency and insert a specified period during which compensation shall be paid for partial disability and for specific injuries.

The increase in compensation has nothing to do with the increased cost of living consequent on the war, for in Pennsylvania the compensation is dependent solely on the wage earned and is not limited to a certain amount, as in West Virginia. The compensation has therefore increased with the advance in wages. Even before the war the mine workers of Pennsylvania argued that the compensation should be larger. At earlier conferences the labor representatives sought an increase that would bring the compensation up to 50 per cent. or 60 per cent. or even 66⅔ per cent. of the weekly wages. The demand is now for 70 per cent. The compensation board approves of an increase, but has not set a definite figure on the compensation to be paid.

The executive boards of the five Pennsylvania districts of the United Mine Workers of America have met and have ratified the work of the presidents, and these presidents on Feb. 20 called on Governor W. C. Sproul and Attorney General Schaeffer and discussed these proposed amendments. Governor Sproul declared that he would favor any changes recommended by members of the compensation board, or agreed on between representatives of organized labor and members of the compensation board.

Representative David Fowler, of Scranton, who is a national organizer of the mine workers' union, has been selected as the man to introduce to the legislature the bill containing the proposed amendments. What the compensation should be is not easy to determine. What is clear is that the compensation should not be made so high as to make any numerous body of men prefer idling under compensation to working without it.

An amendment to the workmen's compensation act was introduced in the House on Feb. 20, by Mr. Deitrich, Allegheny County, which provides that where injury arises from the failure of the employer to obey safety requirements no consideration shall be allowed to affect the liability of the employer. The injured person or his representative or his dependents may either claim compensation or institute civil proceedings.

Militia Gone, Must Have State Police

In West Virginia, the mine workers and particularly their leaders bitterly oppose the proposed police-patrol or indeed any other constabulary bill, although it is generally conceded that the state must have some form of police protection now that there is no longer any national guard available. The Governor will include in his call for a special session the question of state police legislation and it is generally believed that the legislature will enact laws providing for a state police despite the opposition of the mine workers. The Governor and others have pointed out to those opposing the legislation that the quickest way to eliminate the mine guards often employed by individual corporations is through an organized form of police supervision vested in the state. The miners do not seem to be able to see this, however.

District President Implicated in Affray

On the charge of having been implicated in a shooting affray at Glen White in November, 1917, J. R. Gilmore, president of District 29, together with Lawrence Dwyer, international board member for that district, and district board members Stafford and Clendenin, of the United Mine Workers, were placed under arrest at Beckley, W. Va., on Feb. 18, a warrant having been sworn out by Geo. W. Williams. Twelve other warrants were also sworn out against certain mine workers charged with being implicated in the shooting. This is alleged to have occurred during a strike and just at that time of the day when nonunion mine workers were leaving the mine. Refusing to require a bond for $3000 the trial justice released the men under a $1000 bond. No one was injured by the shots fired.

Farrington Plans Shorter Day and Week

Illinois miners are getting ready to demand a six-hour day and a five-day week. This is indicated in a "keynote" letter which Frank Farrington, president of the United Mine Workers of Illinois, sent out under date of Feb. 21, in which he frankly says: "Our goal should be a six-hour day, five days per week, for all the miners in the United States, with no double-shift on the coal allowed except as necessity may require. Development for increased tonnage should not be considered a necessity. Every atom of strength of the United Mine Workers of America should be employed to accomplish that end and then we should strive to have the Government prevent the opening of new operations, except as new operations may be needed to supply the demand for coal. If this is done every mine worker will then have a chance to earn a decent living and the matter of equalizing and adjusting wages will be easy of accomplishment, and until it is done unemployment and consequent want and suffering will ever be present among the mine workers of the United States."

Leading up to the demand, Farrington says: "The great evil of mining is unemployment and the absence of uniformity in wages paid as between competing districts. Even now hundreds of thousands of mine workers are feeling the pinch of slackened work, and, as a result, hunger and want are stalking in their midst and threatening their future. True, it is hoped that industrial activity, temporarily suspended, will soon resume a normal status and that the surplus of coal now above ground will soon be consumed and the situation thus be relieved, but even that will not cure the evil from which mine workers suffer and the reason it will not is because the mining industry is fully 50 per cent. overdeveloped, which means that there are fully 50 per cent. more men employed in the mines of the United States than are necessary to supply the normal demand for coal.

"So long as that condition exists unemployment will exist and work will be best where wages are lowest, as the demand for coal will be largely supplied from districts where it can be purchased the cheapest, with the inevitable result that wages in districts having higher wage scales will always be threatened with lack of employment. Therefore we must create a condition whereby districts having low wages will have no advantage over districts having high wages when it comes to the number of days worked. Or in other words we must create a condition whereby a low wage scale will be of no competitive value to an operator when it comes to getting a market for his coal, and the only way that can be done is to create a condition that will make it necessary to work practically all the mines full running time in order to supply the demand for coal, and the only way that can be done is by reducing the hours of labor, and our salvation is in our ability to do so."

Compensation Revision in Missouri

The Workmen's Compensation Committee of the Missouri Legislature, after futile efforts to agree upon a substitute bill which would reconcile differences between employers and employees, has voted to report favorably, with amendments, the bill favored by the employees. As this bill provides for monopolistic State insurance, to which the employers are strongly opposed, and also for other reasons, the employers will make every effort to defeat the bill and are confident that they can do so in the Senate if not in the House. The insurance companies also will fight it.

The principal amendments agreed upon by the committee provide: A waiting period of five days, for which compensation shall be given if the incapacity extends over three weeks and a maximum compensation of $30 a week. The amendments also arrange that the workmen's compensation commission shall decide whether compensation shall be in a lump sum or shall be spread over a period of weeks. It prevents an injured employee from receiving more as compensation than he would have received as wage for an equal period of disability. The salaries of members of the commission are reduced from $7000 to $5000 a year and a fine and imprisonment is provided for any person who is found guilty of making false statements about the condition of the insurance fund.

Block-Coal Company Settles Strike

When the contract was made in the block-coal district of Indiana, of which Brazil is the principal town, a differential of 6c. per ton was provided where the top coal is left. The contract provides that the men receive 67c. per ton for the loading of the coal and that the company drill the shotholes. The men of the Powers Collieries Co. at Mine No. 2, recently, contending that the drilling force of the company was inadequate and too slow in drilling the holes, went on strike. The company settled with the men by providing that they drill their own holes and in return receive 2c. more for loading, or 69c. per ton. The roof is bad and the top coal has to be left to support it.

Want Compensation Act Amended

The coal miners of the Crowsnest Pass District, through the medium of Gladstone Local Union, No. 2314 United Mine Workers of America, are petitioning for amendments to the Workmen's Compensation Act of British Columbia. They declare for a variety of reasons that changes should be made providing for the board being represented in the Crow's Nest District by permanent representatives; for an increase of 100 per cent. in the compensation allowed for dependents; for a clause permitting workmen to take proceedings at common law in case of serious injuries and where it is suspected that the accident was caused by negligence; and for an amendment that will allow appeals from the decision of the Workmen's Compensation Board to the Court of Appeal.

Nova Scotians Don't Stop to Eat

On Feb. 24, the Amalgamated Mine Workers of Nova Scotia adopted an agreement which reduces the working day from 12 hours and 10 hours to 8 hours. The "datal" men who are paid by the day, and not by the hour, will get the full day wage without any reduction, but the "hourly paid" men will receive no change in the hour rate.

The men are well pleased that the operators met with them to discuss terms and are also much gratified that they have secured the eight-hour day. The proposal of the operators which the mine workers have accepted is as follows:

"The operators have carefully considered the proposal of their employees for an eight-hour day, and being most desirous so far as possible to meet their wishes, would submit the following offer:

"1. The collieries will commence to hoist coal at 7 a.m., at which time all the men must be in the mine.

"2. The day's work will cease at 3 o'clock, when all arrangements will be available for conveying the men to the surface.

"3. The surface men around the bankhead and screens associated with the handling of coal are to be on duty between the hours of 7 a.m. and 3 p.m. and for a short time after, if necessary, for the purpose of attending to such duties as will facilitate their own work, such time not to exceed a half hour.

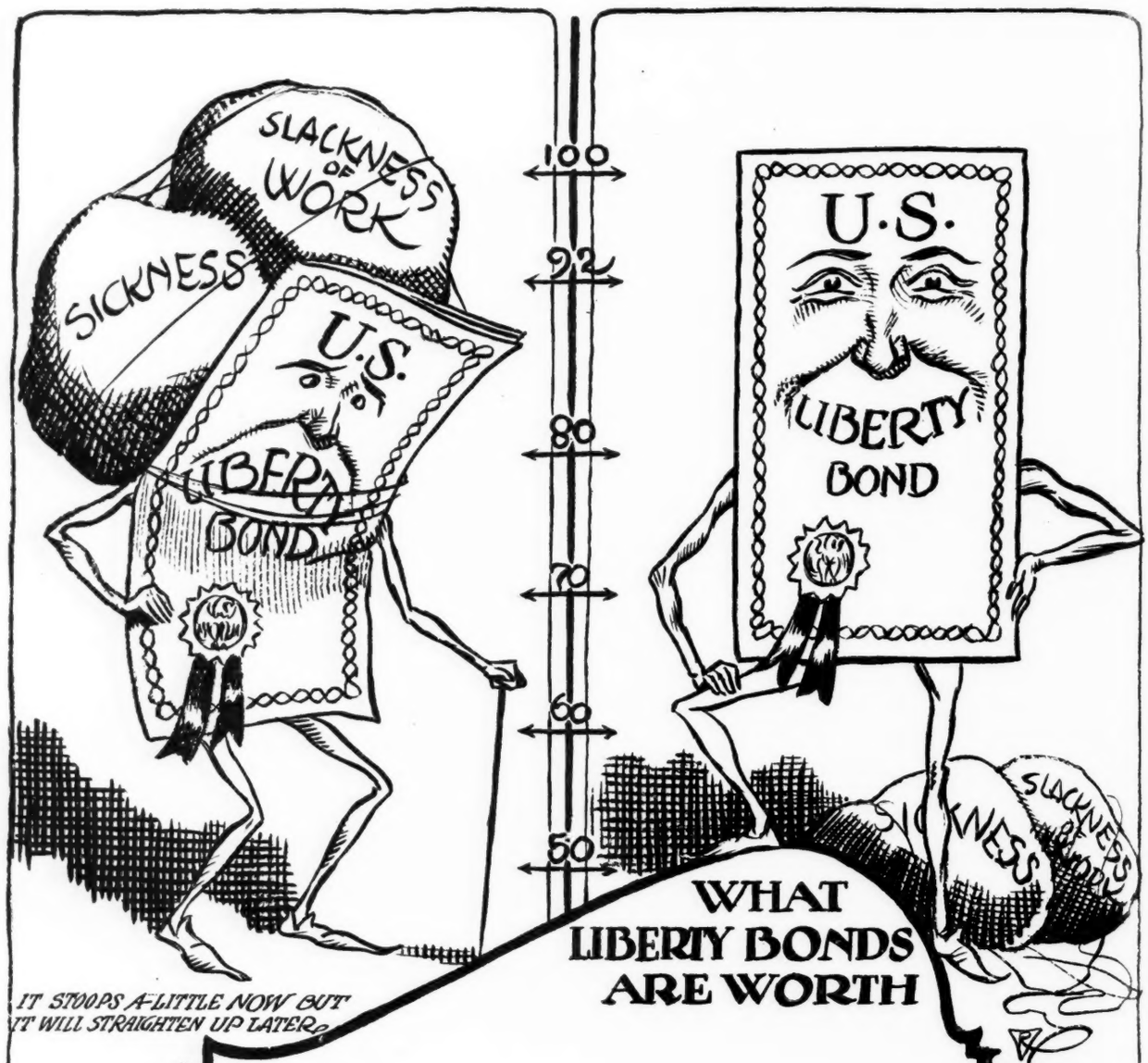
"4. The working day of other surface labor around the collieries to be from 7 a.m. to 4 p.m., with half an hour for dinner.

"5. Where continuous attendance is required, the shifts will be eight hours instead of twelve, both surface and underground at the same pay.

"6. The conditions peculiar to certain localities will be adjusted locally.

"7. The agreement will become effective Mar. 15, 16 or 17, according to the date on which the pay rolls are made.

"Clause 1 means that the mine shall run continuously between the hours named, without any stop whatever."



WHAT LIBERTY BONDS ARE WORTH

Slack work and sickness are making some patriotic men sell the Liberty Bonds they worked so hard to get. No one should sell a bond, if by a little skimping he could keep it. All payments still due on bonds should be made as soon as possible.

But if bonds must be sold, don't sacrifice them for little or nothing. Any bona fide broker will give you at least $92 for a $100 bond and more than that for the 3½ per cent. bond, as first issued.

Liberty Bonds have fallen in value because so many are being sold and no effort has been made to induce any one to buy them from those who want to sell. Patriotic people who will buy new bonds will not purchase old ones, though they cost less and are just as good.

Unless in Trouble Keep Your Liberty Bonds.

DISCUSSION BY READERS

Cost Reduced in Machine Mining

Letter No. 1—Speaking of increasing the output of mines and reducing the cost of their operation, referred to by one writer in *Coal Age*, let me say that, in my short experience as mine foreman, I have been able to greatly increase the output of our mine and at the same time show a lesser cost since installing two Sullivan coal cutters. The performance of this machine has exceeded my best expectations.

The machine we have installed is handled easily and cuts well down to the bottom, leaving from 4½ to 5 in. of bottom coal. I will not attempt to describe minutely the special bit used in this machine, which is one of its valuable features and which, I believe, enables it to forge ahead without bucking, even when operating on a soft bottom; and when a horseback is struck, the machine never stops.

An important point in regard to keeping the cost low is that no machine boss is required to look after the machines and keep them in good condition. So far, our machinemen repair their own machines very easily. Although I have worked in mines where other types of machines have been used, I have never known them to perform the same work with as little trouble.

Our cutters can easily cut from 15 to 20 places in a single night and are not as tired as if they had mined and loaded five cars of coal in that time. I cite this experience hoping that it may prove of value to other young foremen who are making every effort to reduce operating costs in their mines. I believe that the mining of coal by machines, where conditions will permit of their use, is the solution of the cost problem.

Oliphant Furnace, Penn. JOHN H. WILEY.

Correct Accounting

Letter No. 1—Referring to the question of an accountant, which appeared in *Coal Age*, Jan. 30, p. 248, and the reply given by the editor, on the same page, allow me to say that the distinction made between the capital invested in any permanent enterprise and the working expenditures of the business affords some field for discussion among accountants. However, in the case of coal mining and other similarly wasteful enterprises, experience teaches that the field for such a discussion is extremely limited.

Kindly permit me to express the opinion that, after a mine has been developed and equipped to its normal and regular output of capacity, the cost of any additional equipment that may be required to maintain the output, under the increasing length of haul, due to the advance of the working faces in the extraction of the mineral, should be charged as ordinary and necessary expense of operating the mine.

Likewise, also, the cost of additional copper wire, piping, and other conductors for the transmission of power into the extended workings are chargeable to the same account, forming, as they do, a part of the necessary working expenses of the mine. In the same manner, additional mules, mine cars, locomotives, mining machines, pumps, and other appliances supplied to replace those worn out and discarded in the service of the mine, form a part of the legitimate working expenses and, as such, should be charged to the expense account.

REGARDS EQUIPMENT RENEWALS AS EXPENSE

My reason for this opinion, which appears to be at variance with that of the editorial reply to this inquiry, is as follows: The cost of such items as I have named is a constantly recurring expense in the operation of a coal mine and may be regarded as constituting a practically constant factor in the cost of production per ton of coal mined, from year to year. It makes no appreciable difference in the final result of the business whether the cost of these items is charged to operating expense or capitalized and entered as additional equipment, which must then be offset by deductions representing a certain depreciation that would have to be determined, each year, during the life of the mine.

My opinion is that, as a practical matter, it is better to dispose of such costs by direct charge to operating expense, rather than to introduce vexatious refinements of accounting, which would be necessary if such costs were to be capitalized and depreciated.

THOMAS T. BREWSTER, Gen. Mgr.,
St. Louis, Mo. Mount Olive & Staunton Coal Co.

[Regarding the suggestion of this correspondent, it would be interesting to know how the equipment ledger of a large operation is to be kept in a manner that will show the correct valuation of the equipment on hand and in use in the mine, at the close of any fiscal year, unless new purchases of equipment are regularly entered as such when taken into the mine.

It is readily granted that a new pump or other machine may be purchased to replace one that is worn out and discarded. At the same time, the new machine may be an improved type, which it generally is, and have a greater value than the machine it replaces. Again, the change in market values varies widely, from time to time, depending on relative supply and demand, quality of material, cost of labor, style and degree of workmanship, etc., etc.

It is quite clear that a correct method of accounting can only be maintained when the equipment and other accounts are properly charged and credited with each transaction as it occurs. The best business practice requires that a complete inventory of equipment and material be made at the close of each fiscal year, and a suitable valuation placed on the several items of the account. Only in this manner is it possible to show

the present condition and value of an operation, which would have to be done should a change in ownership be contemplated.

Coal Age will be glad to learn the opinions of other managers, superintendents, and accountants.—Editor.]

Safeguards in Trolley Haulage

Letter No. 1—The inquiry of "Motorman," *Coal Age*, Jan. 9, p. 71, is an interesting one, particularly to men who realize that an electric installation in a coal mine is an important factor in its operation. As stated in the answer to this inquiry, the installation of an electric-haulage system should be made by a practical and competent mining electrician, whose contact with various conditions that exist in coal mining will enable him to provide against any contingency that is liable to arise.

When a management, wishing to produce coal at a minimum cost, decides to electrify its mines it is important to consider carefully the necessary electrical appliances that will make the proposition a paying investment. Faulty design and incompetent installation mean either extensive changes, later, or increased operating and upkeep expenses. Knowing this, the competent electrician makes a careful survey of the situation, which enables him to design the installation so as to meet the requirements in the simplest and most economical manner.

Essential Factors in Electric Haulage

The efficiency of electric mine haulage depends upon two important factors; namely, the overhead circuit and the track-return circuit. A first-class, bonded-return circuit always bears a definite relation to the tonnage of coal hauled. Therefore, one of the safeguards of economical haulage is to provide against the serious loss that is sure to follow the poor bonding of the rails. In fact, the return circuit of an electric haulage should be tested, from time to time, if the highest efficiency of the system is to be maintained. In all permanent work the "compressed-terminal bond" should be employed. The channel-pin method of bonding should only be used for temporary work.

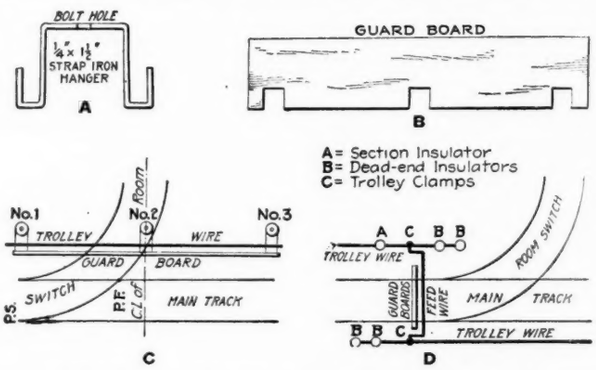
In the installation of the overhead circuit, every precaution should be taken, both outside and inside of the mine, to minimize fire hazard; reduce the cost of upkeep; provide economical operation; and to safeguard employees by eliminating, as far as possible, the danger of contact with live wires. The efficient and economical operation of electric locomotives, cutting machines, pumps, fans, etc., depends on the selection of motor equipment, the capacity of which must be sufficient to perform the required work without unnecessary heating, and yet avoid operating the motor too far under its economical load. Both feeder and return circuits must provide ample conductivity to prevent excessive drop in voltage.

All trolley-wire hangers must be installed true with the track and practically at the same height above the rails, in order to avoid the danger of a trolley pole jumping off the wire, and excessive arcing at the trolley wheel. The center of each hanger should be from 6 to 8 in. outside of the rail, unless otherwise modified by the state mining law or the size and type of locomotive to be used.

The severest mechanical stress placed upon hangers is that encountered on curves, where a sufficient number of hangers and trolley clamps should be installed to prevent them from being bent out of line. No fixed rule can be given for spacing the hangers apart, as this will depend chiefly on the degree of curve. However, in common mining practice, a distance of 8 or 10 ft. has generally given satisfactory results.

On a straight track, some difference of opinion exists as to the proper distance apart of installing hangers, in the use of 250 and 550 volts. But, hangers should never be spaced so far apart as to cause an undue sag in the trolley wire. Because of varying conditions in different mines, this is the only safe rule that can be given. My own practice has been to adopt a distance of 18 ft., center to center of hangers, for 0000-trolley wire, on straight tracks, and from 8 to 10 ft. on ordinary mine curves.

In order to safeguard employees from contact with the trolley wire, guard boards must be installed at all points where men and animals pass under the wire. For



ELECTRIC-HAULAGE INSTALLATION IN MINES

the support of the guard boards, the strap iron hanger, shown at (*a*) in the accompanying figure, is the simplest device to employ. This is made to be supported by the regular trolley-wire hanger, without drilling any extra holes, the same bolt that supports the latter also passes through a hole in the strap-iron hanger.

The form of the guard boards used to protect the trolley wire is shown at (*b*) in the figure. Three hangers should be installed at each roomneck where the trolley wire crosses the mouth of the room. These hangers support two guard boards, 1 x 6 in. and of suitable length to protect the wire. As indicated in the figure, the boards are made with three notches to fit the three hangers.

At (*c*) in the figure, is shown the best location of the three hangers, No. 1 being opposite the point of switch, No. 2 on the center line of the room, and No. 3 beyond the point of frog. When the expansion bolt has been driven into place in the roof the strap-iron hanger is held up against the roof while the trolley-wire hanger is screwed on the expansion bolt, thus holding the strap hanger firmly against the roof. Weather boarding is quite generally used for guard boards, since it is pliable and easily adapted to any conditions.

An important matter, in safeguarding the efficiency in trolley haulage, is the proper location of the trolley frog. It is a difficult matter to give a fixed rule here also, because of the difference in degree of curves em-

ployed and the spread of the trolley frog. I have generally found good satisfaction in locating the trolley frog at a point where the lead rail of the switch has deflected 6 in. from the straight rail on the entry, this measurement being taken between the outside edges of the two rails.

While this rule has given good satisfaction in my own practice, it is well to remember that the test of the proper location of a trolley frog is the freedom with which the trolley pole operates over the frog, without jumping, both when the motor is running over the switch and on the main line. If the trolley jumps off the wire when crossing the frog, the location of the latter should be changed. The jumping of the trolley pole means delay and loss in efficiency.

Hanging Trolley Wire on Room Headings

Where it is desired to install a trolley wire so as to avoid its crossing the roomnecks, it is necessary to transfer the wire to the opposite side of the road, as shown at (*d*) in the figure. A section insulator (*A*) should be installed outside of the first room, where the transfer of the trolley wire takes place. A feeder wire of equal carrying capacity is then used to carry the current across the entry to the opposite side of the track. This feed wire is soldered to two trolley clamps (*CC*) attached to the trolley wires. As shown in the figure, the feed wire is protected by guard boards.

I have only seen one installation of this kind in use and, owing to its inconvenience, it was later abandoned. The locomotive must be provided with two trolley poles and there is much delay in the use of the system. The usual practice, in some of the largest mines, is to install the trolley wire on the room side of the entry. This has given good satisfaction and, practically, no accidents have occurred when the installation has been properly made. In any case, a section insulator located at the mouth of the heading enables the current to be cut off, if desired, when the locomotive is out of the heading.

T. C. Hughes,
Windber, Penn. Mine Electrician.

Letter No. 2—Referring to the inquiry of "Motorman," *Coal Age*, Jan. 9, p. 71, asking for the simplest and best method of protecting the trolley wire in mine haulage, kindly permit me to submit for his consideration a scheme that I have found very practical and which I believe is the simplest device that can be used for that purpose.

My plan is to have the mine blacksmith take a piece of strap iron 1½ x ¼ in., say 20 in. in length, and bend it in the shape shown in my rough sketch. [See Letter No. 1, Fig. (*a*)]. A hole is then made in the center of the upper bend, to fit the bolt that supports the bell or other form of trolley hanger.

The use of this device is clear without further explanation than to say that two or more of these supports having been placed in position and made secure on consecutive hangers of the trolley wire, weatherboards or slats, 4 or 5 in. wide and cut to the proper length, are placed in the supports, a board on each side of the trolley wire.

In my mining practice, this arrangement has been found to give good satisfaction; it is cheap, quickly made and put in place. It has been my custom to have the blacksmith make a number of these supports, which are kept on hand ready for use as needed. The dimensions given in my sketch are only suggestive, as the supports described can be bent so as to fit any hanger in use in the mine, and this should be done to insure the best satisfaction.

Mine Mechanic.
Rosebud, W. Va.

Mule Power in Mine Haulage

Letter No. 1—Replying to H. R. S., who asked, in *Coal Age*, Feb. 6, p. 293, "What is a fair estimate of the work that a good average mine mule or horse will perform when working under average conditions, in a level seam," allow me to give a little of my own experience in respect to mule haulage.

From the records of a few years ago, now before me, a mule hauled 116 wagons and traveled 14 miles; another hauled 94 wagons, traveling 11 miles; and yet another, 27 wagons, traveling 17 miles. These records refer to uneven grades and a 10-hour shift.

My opinion is that, on well-drained roads, in a level seam, the average mule or horse will travel 15 miles, in a 10-hour shift, with one hour to eat and rest, which means 9 hours of actual work. When gathering cars with mules, the longest distance hauled should not exceed 1000 ft., and the shortest distance may be, say, 200 ft., making the mean average one-way haul 600 ft., or 1200 ft. for the round trip. Then, if a mule will travel 15 miles in a single shift, he will make $15 \times 5280 \div 1200 = 66$ trips.

On a level track the mule will haul two 2-ton wagons, or 4 tons of coal, each trip. Expressed in ton-mile hours, therefore, the work of an average mine mule would be $4 \times 15 \div 9 = 6\frac{2}{3}$ ton-mile hours, which is practically the estimate given in the reply to this inquiry by the editor.

The record of the faithful mine mule is one that cannot be idly set aside, where the conditions regarding length of haul and grade are favorable, it is an inducement to keep the mule in harness rather than to harness Niagara.

R. W. Lightburn.
Perryopolis, Penn.

Drawing Pillars in Machine Mining

Letter No. 9—Referring to the inquiry on this subject, *Coal Age*, Jan. 2, p. 32, it is unfortunate that the writer does not give the thickness of the pillars between the rooms, as this is an important factor in the work of drawing pillars with machines. He states that the rooms are 27 ft. wide, which would seem to present the possibility of danger of the roof pressure swinging over onto the pillars and starting a squeeze, which would not only endanger the pillar work but cause a large loss of coal besides. It is possible, however, that the pillars are of sufficient thickness to resist this action.

The seam mentioned here being from 4½ to 5 ft. in thickness and the depth of cover 200 ft., one must be guided, in deciding on the best method of drawing back the pillars with machines, by considering the thickness of the sandrock roof and the nature of the material immediately above it. If this sandrock is, say only 2 ft. in thickness and overlaid with several feet of soft

shale, such a roof can be easily fractured, with much less resistance in the pillars, than if the sandrock above the coal was from 4 to 6 ft. in thickness or even more. It is clear, therefore, that this is an important consideration and one that must be taken into account in deciding the method to be employed in extracting the pillars

If the problem was mine for solution, I would start and make a 60-ft. cut through the rib in the innermost room, following this with a 40-ft. cut through the next rib outby, a 30-ft. cut through the next rib and 20-ft. cuts in each of the three following ribs, making six ribs cut through in all. Assuming the rooms are driven on 40-ft. centers, there would thus be made an open length covering six ribs and seven rooms, which would give a total length of 267 feet.

The next cuts are made in each rib, after leaving an 8-ft. stump for the protection of the men and the machine, and are as follows: A 30-ft. cut in the innermost rib, a 25-ft. cut in the next rib outby, a 20-ft. cut in the next, and 15-ft. cuts in each of the three last ribs. Each of these cuts is protected, as stated, with an 8-ft. stump that is taken out later.

Watching for the First Break to Determine the Angle of Fracture

In my estimation, by the time this extraction is completed, the indications will determine the particular angle of the fracture line that will give the best results. However, let me say that when mining under a strong sandrock roof and with the expectation of drawing back the pillars with machines, the rooms should be driven with a less width, unless the pillars are made equally wide.

The angle of fracture, or the angle that the line of fracture makes with the heading, should not exceed 25 or 30 deg., so as to throw the thrust on the ends of the pillars and not cause the weight to ride over onto them, a distance half-way down the room. It may be wise to still further reduce the angle of fracture to, say 15 deg., under a 40-ft. sandrock cover, or even make the fracture line parallel to the heading, by altering the width of the cuts in the ribs, previously given. I would even suggest using three rows of chocks for support behind the retreating pillars, instead of leaving the 8-ft. stump previously mentioned. These chocks should be moved forward, one row at a time, as the work on the pillars progresses.

R. W. Lightburn.

Perryopolis, Penn.

Efficiency of Mine Officials

Letter No. 2—The letter of William Gorman, *Coal Age*, Jan. 16, p. 159, interested me much, drawing attention as it did to the need of greater efficiency on the part of mine superintendents. I agree with the suggestion that there has been too much undeserved criticism of mine foremen, while little has been said in respect to superintendents; but, apparently, even Mr. Gorman cannot resist the opportunity of giving the much abused mine foreman a jab, in his letter.

Let me say, here, that if any good is to come out of a discussion, we must stick close to the point. To my mind, a good superintendent shows his ability by the foremen he employs. Having but one pair of eyes, the superintendent cannot see everything that goes on in the mine. He must rely, to a large extent, on his underofficials; if they are the right kind of men he can trust them to see that his orders are carried out.

In the mining of coal, there is no room for a superintendent who continually wears a white collar and whose knowledge of things in and around the mine is only what has been told him by the mine foreman or the fireboss. There are many things, of course, to be looked after on the surface; but more than all else, in importance, is the development of the mine and the daily operations underground, on the success of which the profits of the mine depend. No one, today, considers a mine superintendent efficient who visits the mine on rare occasions only.

When a Superintendent's Visits to the Mine Do More Harm Than Good

Speaking of superintendents, there is one class of these officials that do more harm than good by going into the mine. The mine foreman would fare far better if they stayed out altogether. They will slip into a mine and, unknown to the foreman, visit the working places and make inquiries of the men regarding the foreman. Such a practice can only have a bad effect on the men, as it tends to decrease the prestige of the foreman and destroy his authority in the mine.

In common with other superintendents, I like to go into the mines alone, visit the working places and chat with the men; but if they start to talking about their claims for yardage, or lost cars, or other allowances that should be made them, I refer them promptly to the foreman, telling them he is the man to see. But it often happens that I mention the matter to the foreman myself, later, for the purpose of informing him of the disposition of his men.

However, when a superintendent expects to be in the mine later in the day, I think it is only right for him to mention the matter to the foreman in the morning. It would have a tendency to disarm any lurking suspicion of his foreman that he was tracking him about the mines, which any man would naturally dislike and which would tend to arouse resentment in his mind where, otherwise, none would exist.

The Successful Mine Superintendent

The successful mine superintendent must be broad-minded and possess a thorough knowledge of all outside work and equipment; but, above all he must be a practical miner rather than an accountant whose chief duty is to keep an accurate record of supplies and costs in and about the mine. The superintendent is the man to whom many questions and complaints are constantly brought by the women of the place, and tact and intelligence will be needed to handle these successfully.

One thing is certain, however, and that is a superintendent will make his foreman either like to see him come around or dread his appearance in the mine. When a foreman, myself, I always tried to keep clear of the superintendent who was continually telling me what he used to do when he was bossing. I have known superintendents who, no matter what bad conditions were presented, could always tell of having experienced worse conditions themselves in mines where they were in charge.

Such a superintendent thinks to spur his foreman on to greater efforts; but, in reality, he is discouraging him. The "super" who never sees anything that a

foreman has done to improve the mine, but is constantly looking for things with which to find fault, is no help to his foreman. Whether consciously or unconsciously, such a superintendent is a hindrance to the work.

When a foreman, with some very pardonable pride, shows his superintendent work that he has accomplished and is told "how it ought to have been done," instead of receiving the commendation he had a right to expect, the effect is to discourage him. It is, also, a bad idea to keep promising a foreman this or that, when the superintendent well knows there is little chance for the fulfillment of his promise, until conditions in the coal trade materially improve.

On the other hand, let a superintendent encourage his foreman in every way possible; commend him for a job well done and never take him to task or reprove him for his faults in the presence of his men. Be on speaking terms with all the men. A good word acts as a tonic and makes them better and more faithful workers. Even the trapperboy smiles to himself after the big superintendent has passed him with a good word. There are a thousand and one things that enter into the make-up of a good superintendent besides cost-sheets and figures. THOMAS HOGARTH.

McIntyre, Penn.

Letter No. 3—The incident narrated by William Gorman, *Coal Age*, Jan. 16, p. 159, regarding a barber who rose to a position of responsibility and trust in charge of a mine, reminds me of a similar case that I observed some time since. A man who had been a good grocer is now in charge of one of the most up-to-date and best producing mines in this vicinity. It is hardly necessary to add that, in his new position, he is making good.

While I am not in as close contact with mine superintendents as some of the other writers in *Coal Age*, I am in a position to observe many of their qualities that count either for good or for bad, in mine management. The results of my observation make me conclude that there is great need, indeed, for more efficiency on the part of the higher mine officials. Too often it happens that, as Mr. Gorman has suggested, these officials lack ability and experience. Frequently, the superintendent has one or more relatives, or friends belonging to his lodge, whom he keeps on the payroll simply because of such relationship and not for the work the man is capable of doing.

Loss in Efficiency Due to the Superintendent Overseeing Too Many Mines

One or two instances will illustrate the point I have in mind. A single large coal company, hereabouts, owns and operates five or six mines. There is but one superintendent in charge of all the mines, and it is a practical impossibility for him to keep in touch with these different operations, which are some distance apart. He is wholly ignorant of many things that are done in the mines and which lower the standard of efficiency by hindering the work and often causing absolute loss to the company.

At each of the mines, there is a mine foreman who has charge below, while a topboss is in full charge on the surface. It often happens that there is but little coöperation between these two underofficials, although the superintendent hears little of their differences.

For example, at one of these mines, it has long been the custom for the topboss to prepare and send down into the mine dry sand for the motormen to use on the sharp grades. One morning, recently, the sand was not sent down as ordered and the motormen were obliged to do the best they could. As a result, one trip got beyond control when descending a heavy grade. There was a wreck that ditched the trip, knocked out many timbers, tore up the tracks and delayed the mine for five hours. The mine foreman, however, knowing that the topboss was a relative of the superintendent, did not report the true cause for the accident. This left the management in ignorance of the real seat of the trouble.

Difference in Ways and Means of Doing the Same Thing in Different Mines

Another instance that can be cited shows a sharp contrast, in the efficient management of two of these mines, in respect to the handling and sharpening of the bits for the coal-cutting machines. In one of the mines, the dull bits taken from the machines are thrown into a box made of 4-in. pipe equipped with a lid, having a hook attached to hold it shut. This is an old-fashioned custom. Each machine may have three or four of these boxes, which are sent to the shaft bottom when full. There they remain until enough of the boxes arrive to be sent up on the cage. At the surface, they are taken to the blacksmith shop and sharpened when the smith has time. The system often causes much delay.

Compare the instance just cited with the arrangement in another mine, where a special truck is provided into which the dull bits are thrown. When full the truck is taken to the shaft bottom, hoisted on the cage and sent to the shop where the bits are sharpened promptly and again sent into the mine. In this case, also, the superintendent has no intimate knowledge of affairs and it would be an accident that would inform him of the different conditions in these two mines.

In the same two mines, also, different methods are in use for delivering power to the electric machines which are employed to cut the coal. In the first mine mentioned, the power is delivered by a separate, independent wire leading to the working face. This wire is poorly hung, lying or resting in any old way on its supports, while the dead or return wire is so covered up with slate, in many places, that it will never be recovered. Contrast this condition, now, with that in the second mine mentioned where the power for the coal cutters is taken directly from the trolley wires, and the return is through the rails which are properly bonded and examined every week.

In closing, let me say that the success of a mine official lies in his experience and education. An efficient and up-to-date superintendent is one who has derived his experience from actual work in the mines, which has made him familiar with what is required. Every good superintendent is constantly reading and studying new methods and, in my opinion, there is no better source from which to obtain this information than the columns of *Coal Age*, where many suggestions and much helpful advice are freely given for the asking.

Clinton, Ind. EFFICIENCY.

INQUIRIES OF GENERAL INTEREST

Pumping Water in a Shaft

I want to ask the assistance of *Coal Age* in solving a question in shaft pumping. The question is as follows:

A double-acting pump has a piston 6½ in. in diameter and a length of stroke of 4 ft. 6 in. The pump is located at the bottom of a shaft 250 yd. in depth. When the pump is running at a speed of 14 strokes per minute, how many gallons of water will it discharge up the shaft, and what will be the horsepower of the pump, assuming a useful effect of 60 per cent.?

This question is a practical one, and its solution has troubled me for some time past. STUDENT.

———, Alberta, Canada.

It is common mining practice to assume, for the purpose of estimate, that the water-end efficiency of a good pump is 85 per cent. of its piston displacement. The diameter of the pump cylinder, in this case, being 6½ in., its sectional area is $0.7854 \times 6.5^2 = 33.18$ sq.in. and, the length of stroke being 4 ft. 6 in., or 54 in., the piston displacement of this pump when running at a speed of 14 strokes per min., is $14(33.18 \times 54) = 25{,}084$ cu.in. per min. Therefore, taking the efficiency of the water end as 85 per cent. of the piston displacement, the discharge of this pump is

$$G = 0.85(25{,}084 \div 231) = 92.3 \text{ gal. per min.}$$

In calculating the "useful effect," which is the power that must be effective in the water end of the pump and which is here assumed as 60 per cent. of the power developed in the steam cylinder, it is not enough to consider the pump as operating under a head expressed simply by the depth of the shaft or, in this case, $3 \times 250 = 750$ ft. The depth of the shaft, or the distance from the water level in the sump to the point of discharge at the top of the shaft, is merely the "static head" or lift of the pump.

When the pump is in operation, there is developed, in addition to the static head, both a friction head and a velocity head. The velocity head, however, is generally small and can be wholly ignored, in mining practice, whenever the diameter of the column pipe, expressed in inches, does not exceed its length in hundreds of feet.

The friction head developed when a pump is in operation, however, depends on the diameter and length of the column pipe and the quantity of water handled per minute. It is necessary, therefore, to calculate the amount of this friction head and add it to the static head, in order to ascertain the actual total head under which the pump is to operate.

The friction head, h_f (ft.), for a discharge G (gal. per min.) and a length l (ft.) and diameter d (in.) of column pipe, is calculated by the formula

$$\text{Friction head,} \qquad h_f = \frac{G^2 l}{800 d^5}$$

Using a 2½-in. column pipe, which will handle the water discharged by this pump at an approximate velocity of 400 ft. per min. according to average coal-mining practice, and substituting the given values in this formula, the friction head developed, in this case, will be

$$h_f = \frac{92.3^2 \times 750}{800 \times 2.5^5} = \text{say } 82 \text{ ft.}$$

The total head against which this pump must operate is, therefore, $750 + 82 = 832$ ft.

Finally, assuming a useful effect of 60 per cent., as stated in the question, the horsepower required to be developed in the steam end of the pump, to perform the work mentioned, will be

$$\text{Horsepower,} \qquad H = \frac{62.5(231 \times 92.3)832}{0.60 \times 1728 \times 33{,}000} = 32.4 \text{ hp.}$$

This proposition is hardly complete without calculating the size of the steam end, or the diameter of the steam cylinder required to develop the estimated horsepower of the pump. The total pressure on the piston when the engine is developing 32.4 hp., and the piston speed is $14 \times 4\frac{1}{2} = 63$ ft. per min., is

$$p = \frac{32.4 \times 33{,}000}{63} = 16{,}970 \text{ lb.}$$

Then, assuming a steam pressure in the pump cylinder of, say 85 lb. per sq.in., the required diameter of the steam end of the pump is

$$d = \sqrt{\frac{16{,}970}{0.7854 \times 85}} = \text{say } 16 \text{ in.}$$

The size of this pump, to fulfill the specified requirements, will therefore be 16 x 6½ x 54 in., and is probably of the plunger type, which conforms better to the large ratio of the steam end to the water end necessary to overcome the great head on the pump, with a moderate steam pressure, assumed here as 85 lb. per square inch.

In order to maintain this assumed steam pressure, at the bottom of a shaft 750 ft. in depth, it will be necessary to allow for a drop of 5 lb. in transmission from the surface to the foot of the shaft, which will call for a gage pressure in the power house of at least 90 lb.

Also, is is estimated that this pump, under the assumed conditions, will consume practically 20 lb. of steam per min. But, if the steam pipe in the shaft is uncovered, there will result a loss estimated as 38 per cent. of the steam, by reason of the condensation caused by the radiation of heat from the bare pipeline in the shaft.

If the pipe is covered with asbestos, 1 in. in thickness, this loss by radiation of heat will be reduced to practically 5 or 6 per cent. In the former case, with the steam pipe uncovered, it will be necessary to provide for the generation of $(60 \times 20) \div (1 - 0.38) = 1935$ lb. of steam per hour, which would require a 60-hp. boiler for the operation of the given pump under the conditions mentioned.

With a covered pipe line, the loss by radiation of heat and consequent condensation of steam in the pipe is much less. Estimating this loss as, say 6 per cent., the steam delivered to the pump is $100 - 6 = 94$ per cent. of that generated, and a 40-hp. boiler would fill every requirement in that case.

EXAMINATION QUESTIONS

Alabama First-Class Examination, Birmingham, Jan. 20-23, 1919

(Selected Questions)

Ques.—What materials are best for tamping shots and why?

Ans.—A charge of powder placed in a drillhole should be protected by inserting a small wad of clay before proceeding to tamp the hole. The clay should be carefully pressed down against the charge and the hole then tamped thoroughly with some incombustible material. There is no better material used for this purpose than the fine dirt scraped from the roadways where the seam is underlaid with fireclay. The fineness of the dust and its incombustibility adapts it to the purposes of tamping a charge of powder.

Ques.—What is essential to the economical handling of coal?

Ans.—Economy in the handling of coal, from the working face to the tipple, depends largely on the style and character of the mine cars in use. They must be well built and mounted on good trucks equipped with roller-bearing wheels. The cars must be dustproof and of a kind that are easily loaded to their full capacity and can be readily dumped when they reach the tipple.

A good haulage system must be employed and the tracks kept in good condition so as to reduce the power required for haulage to a minimum. Wherever practicable, a storage-battery locomotive should be employed to haul the coal from the working face to the inside parting, where the trips are made up to be hauled out of the mine. It is possible, also, to use the same type of locomotive for hauling the cars to the shaft or slope bottom, or to the tipple, as the case may be.

Particularly in large mines with extended workings, a system should be established, in haulage, that will avoid unnecessary delays, both at the working face and on the road. A sufficient number of drivers or motormen should be employed for gathering the cars, and this work should be proportioned to that performed on the main road in hauling the trips to the mine entrance or tipple. A lack of proper proportionment, in this respect, will cause unnecessary delays and increase the cost of haulage in the mine.

The arrangements on the tipple for dumping should be such as to reduce the breakage of the coal to a minimum and load the cars for shipment as uniformly and regularly as possible, with the least expense for labor. The mine cars should be lubricated at regular intervals and inspected on the tipple each time a trip comes out of the mine. All cars needing repairs should be sent at once to the shop, and returned promptly to the mine when the repairs have been made.

Ques.—Describe the different kinds of brattices and overcasts in use; state how each is built; and say which you prefer and why.

Ans.—A brattice for conducting the air forward in a heading or room is built by standing a row of posts 8 or 10 ft. apart and 18 in. or 2 ft. from the rib. The line of posts extends from the last open crosscut forward in the direction of the working face. Thin boards or good canvas is then nailed to the posts on the side where the fresh air is traveling. Sometimes a slat or board is used to support the canvas stretched between two posts, so as to hold it well against the roof and prevent the leakage of air. The term "brattice" is often wrongly applied to a stopping built in a crosscut.

The most common form of overcast is built by blasting down the roof over the roadway where it is desired to construct the air bridge. This being done and the opening thus made being connected with the airway on both sides of the road spanned by the air bridge, iron girders or rails are thrown across the roadway and supported on the solid rib of coal on either side, so as to form a good foundation for the floor of the air bridge. Planks are then laid on these rails and the flooring thus formed covered with a good bed of concrete, care being taken to stop all holes and crevices through which the air would leak from the overcast into the airway below. It is necessary that the sectional area above the air bridge forming the overcast should be equal to the sectional area of the airways connected. An overcast is always preferred to an undercast, because it is free from the danger of being closed by an accumulation of water or gas, which would prevent the passage of men in time of need.

Ques.—What dangers are met in approaching old abandoned workings, and what precautions should be taken to avoid those dangers?

Ans.—There is always the danger that the old workings may be filled with gas, or that water may have accumulated therein to a dangerous extent. When approaching such old abandoned workings, it is not sufficient to examine the old mine maps and compare them with those of the present workings. No absolute dependence should be placed on the accuracy of the mine maps and surveys, particularly those of the abandoned mine, as such maps may not show the actual working face at the time the mine was abandoned, or there may be some error in the connection betwen the two surveys.

For the protection of the men driving a place approaching old workings, drillholes should be kept 16 or 20 ft. in advance of the place and flank holes should be drilled in each rib of the heading, which is kept 15 or 20 yd. in advance of its air-course. These flank holes should make an angle of 30 or 40 deg. with the rib, in the direction of the old works. A careful watch must be kept for any increase of gas or water, at the face of the heading. Where gas is suspected, safety lamps only should be used. Wooden plugs must be kept in readiness for instant use should one of the drillholes tap an accumulation of gas or water. In that case, the hole should be immediately plugged.

FOREIGN MARKETS AND EXPORT NEWS

Possible Market for American Coal in France

The post-war position of France with respect to coal supplies may make it possible to sell American coal in France during the year 1919. However, until there is some certainty regarding ocean freight rates it is impossible to say whether American coal can compete with English coal delivered in French ports.

Before the war the annual consumption of coal in France was over 60,000,000 tons, of which 40,000,000 tons were produced in the country. It is estimated that the consumption of France proper during 1919 will be in the neighborhood of 55,000,000 tons. Allowance is made in this figure for the reduced consumption of coal by reason of the destruction of thousands of manufacturing plants in the north of France. To this figure should be added, however, 8,000,000 tons which is the quantity of coal required to feed the iron, steel, and textile industries of Alsace-Lorraine, now in French occupation. This makes a total estimated consumption for France of 63,000,000 tons for the year 1919, or about the same as before the war.

It is hoped that French mines during the year 1919 will produce at least 30,000,000 tons of coal. This is slightly in excess of the quantity of coal mined in the year 1917. While there may be a slightly greater production for the year, as mines in the devastated regions gradually resume operations, it must be remembered that the labor needed to mine this coal will in all probability have to be taken from mines in the center of France, with a consequent reduction in the output of that section. There is also included in this estimate of 30,000,000 tons the coal that will be obtained from that portion of the Saar Basin lying in Alsace-Lorraine. The remaining 33,000,000 tons must be imported.

France hopes that England will be in position to export to her during 1919 close to 15,000,000 tons of coal. It is also expected that approximately the same quantity of coal can be imported from Germany during the year. However, if England is not able to export this quantity of coal to France this year, and if conditions in Germany should be such that a corresponding quantity can not be delivered to France, the French will have to look to the United States for whatever quantity is still lacking. Under the circumstances, it might be worth while for American coal exporters to look into the French situation a little in order to be in position to assist France in case of necessity.

Brazil Exporting Coal

According to the "Times of Argentina" Brazil has begun to export coal to Argentina. It will doubtless come as a surprise to many that Brazil possesses any coal mines worthy of comment, but the war has served in great measure to persuade the Latin-American countries to exploit their own resources. Quite a large syndicate is working a mine in the neighborhood of Rio Grande, and those interested in the venture express great hopes of being able to compete with English and American coal in the near future. The coal is said to be similar to lignite, but has a decided brownish appearance. It has been used as bunker fuel by some Brazilian steamers and is said to have given satisfactory results.

Argentina's Coal Imports

Imports of coal into Argentina in 1913 amounted to 4,046,278 metric tons, worth $27,332,611; in 1914, 3,421,526 tons, worth $23,112,407; in 1915, 2,543,887 tons, worth $17,192,644; in 1916, 1,884,781 tons, worth $12,721,695; and in 1917, 707,712 tons, worth $4,780,595.

As Argentina produces no coal of her own, a steadily increasing coal famine culminated in 1917, and produced a serious state of affairs for the railways, the industries and the domestic needs. At the beginning of 1917 the price was about $31 per metric ton of 2204 lb., but rapidly rose to $33 and $35 per ton, as against $8 in normal times. By July, 1917, it had risen to $40, and by the middle of June, 1918, to $50. Both maize and wheat middlings were used as fuel, especially the former, the surplus of which could not be exported. Charcoal and firewood rose to exorbitant prices because of the coal shortage, the former selling for $55 a ton and the latter for $17.50 to $18 a ton. Petroleum likewise showed a rapid increase in price, from $29.72 a ton in 1916 to $40.34 in 1917.

English Coal Market

Under date of Feb. 21 a London exchange states that the household coal market is in a critical position. The markets are almost bare, and special efforts are being made to obtain supplies in view of a strike in the mining regions. All descriptions of coal are firm on the Tyne and Wear, and the best Blythes sell readily at 90s. Gas coals are in keen demand.

House coal is still scarce in Lancashire, but more slack is coming forward at disproportionately high prices. Practically no coal is available in the open market in Yorkshire or the Midlands, owing to unfavorable weather and the strike menace. The latter greatly affects the position in South Wales. Production in Scotland is improving, and lessened Admiralty requirements leave a better margin for ordinary export.

In Newcastle the demand for tonnage far exceeds supply, and coastwise rates are firm on the basis of 17s. London. Scandinavian rates are rather easier. Quotations generally are firm in Cardiff.

The Italian Government has decreed the "temporary" abandonment of the projected state monopoly of the coal industry.

Foreign Freight Rates

W. W. Battie & Co.'s coal trade freight report for Mar. 3 states that shippers to Brazilian and Argentine ports are more than anxious for additional tonnage, but it is most unfortunate that the Shipping Board will not allow neutral steamers to be chartered for this voyage to American coal shippers on rates, as it is causing owners of these neutral boats to charter them on rates from Cardiff to east coast South American ports (some of them having accepted as low as 50/- gross from Cardiff to the Plata); consequently British shippers are selling coal which Americans would sell, if not restricted, as mentioned above.

The West Indian situation is the same as a week ago, and rates on general cargo from United States ports, north of Hatteras, to French Atlantic ports, are $40-$45 per ton net from charter, (on which terms we have recently chartered steamers), and unless coal can stand this freight rate, transatlantic shipments are impractical at the moment.

Steam—Havana, $7.50, 600 tons dis.; Cardenas or Sagua, $9, 300 tons dis.; Cienfuegos $9, 500 tons dis.; Caibarien, $9.50, 300 tons dis.; Guantanamo, $8.50, 500 tons dis.; $9, 400 tons dis.; Manzanillo, $9.50, 300 tons dis.; Bermuda, $9.50, and Bermuda, p. c. and dis. free, 300 tons dis. Kingston, $9.50, 400 tons dis.; St. Thomas, $10, 500 tons dis.; St. Lucia, $11, 500 tons dis.; Santiago, $8.50, 500 tons dis.; $9, 400 tons dis.; Barbados, $11, 500 tons dis.; Port of Spain, Trinidad, $11, 500 tons dis.; Curacao, $10.50, free p. c. Curacao, 500 tons discharge.

Sail (maximum)—Para, $15.50 net; Bahia, $18.50 net; Pernambuco, $18.50 net; Rio, $19.50 net; Santos, $19.50 net; Buenos Aires, $18.50 net; La Plata, $18.50 net; Montevideo, $19.50 net. (Gross rates $1.50 per ton in excess of net rates). On all the foregoing rates, charterers pay vessel's towage to coal port. To Nitrate Range, $16.50 gross prepaid. (Same rate steam.)

The Chartering Committee's rate by steam is $19.50 net; with 1000 tons dis. to Rio, $19.50 net, 1000 tons dis., or $21, 600 tons dis. to Santos, $18.50 net, 1000 tons dis. to Buenos Aires, and $19.50 net, with 750 tons dis. to Montevideo.

England Losing Coal Trade

Normally, coal constitutes between 70 and 80 per cent. of the weight of British exports. Vessels bring bulky raw materials to the United Kingdom and take back manufactured goods of small bulk. Were it not for coal many vessels would have to leave British ports almost empty. In normal times, for example, the United Kingdom imports large quantities of raw materials from Argentina; in 1913 about 7,000,000 tons of British coal were shipped to Argentina. In 1918 British coal exports had fallen to one-half of the pre-war standard. There has been a great increase in miners' wages, which accounts for two-thirds to three-quarters of the cost of coal at the pit mouth. Since 1914 the increase in miners' wages in South Wales has run from 87 to 200 per cent. It has lately been frequently pointed out that the higher prices of coal will both increase the cost of manufacture in the United Kingdom and make it more difficult for Britain to sell coal in foreign markets.

Coal and coke are still on the Export Conservation List of the War Trade Board. Individual licenses are not required for export of coal and coke to Canada and Newfoundland. Shipment to these destinations may be made under export license R.A.C.-63.

Hampton Roads Coal Exports

NORFOLK

			Cargo	Bunkers
Lamberts Point				
Feb. 20	Amer. S.S. Ulysses	Cristobal, C. Z.	12,011	1,256
Feb. 21	Amer. S.S. Lake Gratis	Cristobal, C. Z.	3,232	415
Feb. 24	Nor. Bk. Svavanut	Buenos Aires, A. R.	2,813	
Feb. 24	Amer. S.S. Anna	San Juan, P. R.	1,435	382
Feb. 25	Amer. S.S. Castle Point	Antofagasta, Chile	3,940	615
Feb. 25	Amer. S.S. Silverado	Pearl Harbor, Hawaii	2,362	
Feb. 27	Nor. S.S. Negus	Pernambuco, Brazil	3,683	851
Feb. 27	Am. Sch. Estelle Krieger	Rio de Janeiro, Brazil	1,593	
Feb. 28	Amer. S.S. Lake Charles	Christobal, C. Z.	2,118	500
Feb. 28	Amer. S.S. Bay View	Havana, Cuba	1,998	240
Feb. 28	Amer. S.S. Craycroft	Barbados, B. W. I.	2,588	
Feb. 28	Amer. S.S. Achilles	Cristobal, C. Z.	12,011	1,254
Sewalls Point				
Feb. 25	Dan. Sp. Asgerd	Buenos Aires, A. R.	1,767	
Feb. 28	Amer. S.S. Bristol	Montevideo Roads, F. O.	5,237	1,349

NEWPORT NEWS

Feb. 21	Am. Sch. Charles M. Struven	Point a Pitre, Guadaloupe	900	
Feb. 24	Nor. Sp. Marga	Buenos Aires, A. R.	1,618	
Feb. 25	Nor. Bk. Vision	Rio de Janeiro, Brazil	2,370	
Feb. 25	Nor. S.S. Lysefjord	Santiago, Cuba	998	185
Feb. 26	Amer. S.S. Corsicana	Antilla, Cuba	2,722	276
Feb. 26	Dut. S.S. Ulysses	Amsterdam, Holland	3,441	
Feb. 28	Nor. Bk. Ragna	Rio de Janeiro, Brazil	1,525	
Feb. 28	Dut. S.S. Andijk	Rotterdam, Holland	7,557	1,101

COAL AND COKE NEWS

Harrisburg, Penn.

The Attorney General of Pennsylvania has given an opinion to Seward E. Button, chief of the department of mines, in reference to Sec. 14 of Art. 4 of the Bituminous Mine Code of June 9, 1911.

Chief of Mines asked the Attorney General if Sec. 14 could be modified so as to hold that this section should apply only to mines that are gaseous in character. This section of the act of 1911 refers to blasting in the solid and that all holes shall be fired when all the workmen are out of the mine.

On Aug. 29, 1916, Deputy Attorney General Collins ruled that "shooting in the solid" should be allowed in all mines if it had been the practice before the code of 1911 became a law, providing that the mine foreman would allow it.

In the Huntingdon-Broad Top coal field, which is a non-gaseous district, considerable difficulty has been encountered in enforcing this section of the law by the state mine inspector, and several strikes have resulted. It is contended that it is impossible to mine sufficient coal during the night if the shotfirers must do all their work at night, as the veins are thin, of a heavy pitch and contain much slippery coal. The miners object to this method, also, as they claim they cannot mine enough coal, which naturally reduces their wages.

The point which the chief of mines wished to be enlightened on was whether or not the district inspector could use his discretion as to shotfiring at night, if the mine were of a non-gaseous nature, such as are found in the Broad Top field.

The Attorney General said he could not recede from the views expressed in the opinion of the Department given on Aug. 29, 1916, which said the Section referred to meant gaseous and non-gaseous mines.

The Attorney General concluded by saying, "It often happens that legislation, general in its character may work hardship in particular instances, and that its enforcement in special cases is difficult and impracticable. The remedy for such a situation is with the Legislature. The courts cannot construe legislation so as to make it applicable or inapplicable, according to the ease or difficulty with which it may be enforced, and the Attorney General is bound by the same rules of construction that apply to the courts.

"I am, therefore, compelled to advise you that notwithstanding the abnormal conditions in the Broad Top coal field, and the difficulty of enforcing the provisions of the law as heretofore construed, this Department is unable to place any other construction upon it than that indicated in the opinion of Deputy Atorney General Collins, dated, Aug. 29, 1916."

Uniontown, Penn.

Fire of undetermined origin entirely destroyed the coke-crushing plant of the General Chemical Co. at Newell. At this plant coke bought in the Connellsville region was crushed to ½-in. size to be used in filtering chemicals. The crushed coke was sent from the plant to plants of the company in all parts of the county. The plant will be rebuilt.

Shipments of coal down the Monongahela River maintained a high figure during February, the total being 20,271,000 bushels. While that figure is a decrease of 2,938,000 bushels over January, there were three less working days in February, making the daily average almost equal. The Pittsburgh Coal Co. is reported stacking coal at the Duquesne mills in anticipation of the annual conference of miners and operators scheduled for April. The Carnegie Steel Co. now has four boats supplying the Clairton byproduct plant, each boat making four round trips a week and delivering 96 barges containing 2,000,000 bushels. That company expects to put the "Edgar Thomson" in commission in a short time.

Although the Connellsville coke region is operating generally upon a 50 per cent. capacity there has been no labor disturbance and none is expected. The edge has been taken off an unemployment situation by operators turning a percentage of the men laid off to making sadly needed repairs at plants. Curtailment policy adopted when government prices were removed is still in force, although the tonnage of decreased production is becoming smaller each week. When the curtailment was commenced the average decline was 25,000 tons weekly. It has now been reduced to 8000 tons weekly, and it is expected that production will not go much lower than the present 225,000 tons, coke. Prices continue to remain firm with $4.50 ovens as the basis. A number of operators decline to move tonnage for less than $5 ovens, but some scattered coke is being sold as low as $4 ovens.

Charleston, W. Va.

Biding their time, coal producers of West Virginia are shutting down their mines in preference to letting fuel go below a reasonable price, believing that another 30 days will witness a decided change in market conditions.

Mar. 1 still found many mines closed down, as they had been throughout February, and in the first week of the month there was little to mark any change in conditions. Production is not averaging over 50 per cent. in any instance, and in many parts of the state mines are being operated on one-fourth time.

Coal shipments had dwindled to such an extent that the railroads operating in West Virginia have laid off many crews. A survey of the market by West Virginia producers, however, convinces them that reserve stocks which have been drawn on heavily during the last few months are reaching a low point, and at the same time there is no such accumulation of coal at tidewater shipping points as there was a few weeks ago.

Cognizant of such conditions producers feel certain that orders will begin to multiply now within a short time. There is some demand for prepared sizes and also for splint, gas and smokeless coal. No change in prices has been marked in recent weeks.

New York, N. Y.

The failure of the boatmen to come to terms with the private boat owners has led to threats by the longshoremen to tie shipping up completely in this harbor should the owners resort to efforts to break the strike with strikebreakers.

The strike of the boatmen for increased wages and an eight-hour day was half ended last Friday when several thousand of the workers employed on the boats operated by the Railroad Administration, Army and Navy and the Shipping Board agreed to accept a wage increase varying from 10 to 40 per cent.

The privte boat owners were not a party to that agreement and have refused to grant the demands of their employees. Several conferences have been held and it is said that propositions have been made by both sides. In the meantime boats loaded with coal are lying at the docks waiting for the strike to be ended before they can be towed to their destination.

These boats, which were chartered before the strike was declared, will be taken to their proper destination at the rate named in the charter and the rates for future deliveries will be agreed upon as the result of the negotiations between the boat owners and their employees.

Seattle, Wash.

The coal output in the state of Washington in 1918 totaled 4,128,424 short tons, the heaviest coal production in the history of the state, according to the final report of James Bagley, state coal mine inspector. The next biggest output was in 1917, when the total production was 4,002,750 tons. The first year in which the annual production exceeded 4,000,000 short tons was 1917.

The biggest gain in 1918 was made by Lewis County, where the increased production was 44,000 tons more than in 1917. The output by counties in 1918 was as follows: King, 1,331,601 short tons; Kittitas, 1,730,379; Lewis, 174,621; Pierce, 600,197; Skagit, 5897; Thurston, 271,400; Whatcom, 4603. The output by counties in 1917 was as follows: King, 1,314,366; Kittitas, 1,741,237; Lewis, 130,578; Pierce, 606,049; Skagit, 1000; Thurston, 204,688; Whatcom, 4841.

Seventy-two coal mines were operated in the state in 1918, working an average of 266 days and employing 5847 men. There were 34 fatal accidents during the year. In 1917 there were 27 fatal accidents. The increase in fatal accidents last year was due to an accident in the Burnett mine in August, 1918, in which 12 men lost their lives. There were 692 non-fatal accidents last year as compared with 1025 in 1917.

Mr. Bagley says that the present indications are that the output of coal will not be as heavy in 1919 as last year. He attributes the increased output last year as being largely due to high pressure caused by war conditions.

Though it will be easier to secure coal from now on and consumers have been relieved of restrictions that prevented a free use of fuel, it is declared by state representatives of the Federal Fuel Administration that there is no likelihood of an easing off in price regulations.

The withdrawal of numerous Government demands for coal is said to be responsible for the change in regulations in effecting distribution. Some of the heavy requirements of foreign governments also have been satisfied (notably Chile, which has been taking much Washington coal for the past several months), or have been withdrawn, and coal is certain to be more plentiful than was anticipated at the beginning of winter.

Victoria, B. C.

Some interesting new facts were brought to light by Hon. William Sloan, Minister of Mines, in speaking before the Provincial Legislature to the "Settlers' Rights Act, 1918," which proposes giving those holding property within the Esquimalt & Nanaimo Railway Belt, Vancouver Island, a further opportunity to make applications for their coal rights on the land to which they have surface title. He stated that there were some 45 or more applications for such coal rights dealt with under the Settlers' Rights Act of 1904, which measure first opened the question by legislation, and that altogether Provincial titles had been granted to 7166 acres of coal-bearing land within the boundaries of the railway holdings on the Island.

Mr. Sloan pointed out that when the railway was first given title to these Island lands it had been granted an additional 86,346 acres to recompense it for property which had been alienated to settlers prior to 1884. He stated that to repay the company for the 7166 acres of coal-bearing land taken subsequent to 1904 another 20,000 acres had been deeded to the company. Of the total 2,210,000 acres which, it was computed, was included in the Esquimalt & Nanaimo Railway Belt, it was roughly estimated that there were 356,000 acres of a coal-bearing character. It followed that there still remained to the railway company or its successors some 366,000 acres of coal-bearing lands.

The debate on the proposed 1918 act is still in progress, but it is considered likely that it will be carried. Under its terms the settlers, or their heirs, will be allowed to apply for the coal rights on their lands and, if successful in proving that they have a legitimate claim, will be issued Provincial titles. All this, however, is contingent on the stand taken by the Dominion Government. The latter exercised its prerogative last year and vetoed, or disallowed, the 1917 act, which was of an exactly similar nature. The contemplated action of the Provincial Government in taking the earliest opportunity to reënact the legislation which, apparently, is repugnant to the Federal Administration has created an interesting situation. It would seem that a determined fight has been launched between the Province and the Dominion, it being the contention of the former's government that the Dominion is infringing the authority of the Provincial Legislature in assuming to dictate on a subject affect-

ing nothing more than "Property and Civil Rights." Jurisdiction to handle all matters coming under that heading was clearly alloted to the Provinces under the Terms of Union.

PENNSYLVANIA

Anthracite

Mauch Chunk—Instead of the Lehigh Coal and Navigation Co. entering into an agreement with local firms, as in former years, to take the drifted coal from the dams throughout the Lehigh Valley at a certain royalty per ton, the company is erecting a washery here itself and will take out the coal and market it. Thousands of tons of coal have been reclaimed annually for many years in this way.

Avondale—Ten men were almost overcome while engaged in fighting the old Jersey mine fire at the Chauncey colliery of the George F. Lee Coal Co. on Mar. 5. Prompt arrival of the Delaware, Lackawanna & Western, Coal Department, rescue car saved many of the victims from death. The "Jersey Fire" originated about 20 years ago and after several unsuccessful attempts to extinguish it were made the fighting of the fire was given up until a few weeks ago, when its spreading endangered the Avondale colliery workings. The Lackawanna Coal Co. placed a force of men at work, some on the outside and some within the workings.

Bituminous

Somerset — The Loyalhanna Coal and Coke Co. has been investing in tracts of land in Shade township, deeds recorded showing transfers of a number of individual tracts.

Black Lick—The switch points and railroad connection with the siding of the Smith Coal Co. here were made recently, and shipments from the new mines will be begun in a week or so.

Philipsburg—The Lena Coal Co. has recently been organized and has taken over the new Goodyear shaft at Smoke Run. It is the intention of the company to develop the property to its utmost capacity.

Somerset—The Tri-State Collieries Co. has recently completed negotiations for the acquirement of a tract of coal properties in Somerset County aggregating approximately 2850 acres.

Connellsville—According to figures issued by the various mine inspectors located in the coke region the tonnage made large gains in 1918. The 16th district had a production of 8,867,477, the 9th district 7,189,946, the 5th district 7,011,189, and the 2d district 6,484,742.

Washington—The Lilley Coal Co. has purchased 2300 acres of coal lands lying east of this city. It is thought the tract will be mined for shipment over the Monongahela River. This block of coal connects with one already owned by the Lilley company. The company now owns about 3400 acres.

Blairsville—T. L. Eyre, of Chester County, and Wilbur P. Graff, of Indiana County, have pooled their coal-mining interests in this section under the name of the Kiskiminetas Coal Co., with offices at Blairsville. The consolidated company was formed from the old Kiskiminetas and Roaring Run mining companies.

Springhill — The Winstead Coal Co., Springhill Township, Fayette County, has recently completed plans for the construction of a new coal tipple on the right bank of the Monongahela River, about 1 mile above Lock No. 8. The company has been granted permission by the State Water Supply Commission for the erection of the proposed structure.

Ernest—The Roman Catholic church here was totally destroyed by fire on Mar. 6. The fire is thought to have originated from one of the candles which was left burning by the altar boy, probably igniting some of the draperies. By heroic work on the part of the miners the new parish house, which is but a few feet away from the church, was saved. The church was built a few years ago mainly through generous gifts from the leading officials of the Jefferson and Clearfield Coal and Iron Company.

Greensburg—Coal values in the several Westmoreland County fields were fixed here by the county commissioners for the next three years. Connellsville coking seam is assessed at $900 an acre; the Irwin, Youghiogheny and Monongahela basins at $450; the Greensburg field at $600; Latrobe, north of the Pennsylvania R.R. at $550, and south of the railroad at $800; Ligonier basin, $500; Kiskiminetas Valley, $450, while the Freeport vein was placed at $60 to $100, according to the location.

Herminie—Fire broke out in the large store of the Eureka Supply Co. here recently and totally destroyed the building and contents. The loss is estimated at $75,000 to $100,000. The building was a brick structure and modern in every respect. Besides the store on the first floor there were four living apartments on the second floor. The occupants lost everything. The flames spread to the post office on one side and a company house on the other side of the store. Damage was inflicted upon both, but hard work by miners saved them from total destruction.

Brownsville—The Atlas Coke Co. has closed down its mine and 220 coke ovens at Waltersburg, Penn., indefinitely, on account of lack of orders. There are about 500 more ovens in the Connelsville region on the inactive list than a week ago, and no seeming immediate prospect for revival, although there seems to be a general feeling of optimism that the depression will not last for long.

It is rumored that the Pittsburgh Steel Co., operating a large plant at Monessen, Penn., on the Pittsburgh & Lake Erie R.R. and Monongahela River about 40 miles above Pittsburgh, is arranging to take over the coal and coke operations of W. Harry Brown. These operations consist of two plants in Fayette County, Pennsylvania, on the Monongahela R.R. and the Monongahela River, a few miles above Brownsville, and are operations in Greene County. The plants are large and modern.

MARYLAND

Frostburg—Working conditions are improving in the Georges Creek region. The Broken Heart mine of the Union Mining Co., which has been idle for some time, has resumed operations in full, while all mines of the Consolidation Coal Co., with the exception of No. 9, operated in full all last week for the first time in many weeks. Mines generally are now working with more regularity.

WEST VIRGINIA

Wheeling—Fire recently entirely destroyed the tipple and boiler house of the Mound mine of the J. C. McKinley group of mines near here. Mr. McKinley plans to replace the structure destroyed without delay.

Clay—In connection with the construction of a plant near here, the Lima Coal Co. has made arrangements to install a bucket conveyor system in order to get its coal across the Elk River to the Coal & Coke Ry. for shipment.

OHIO

St. Clairville—The Roby-Somers mine has closed down until May 1, it is said.

Martin's Ferry — The Burlington Coal Co.'s mine here has been sold to the Commonwealth Coal Co. of Pittsburgh. The Burlington company employs about 50 men.

INDIANA

Bicknell—The Pan Handle Coal Co. is building a complete new steel tipple, equipped with the most modern horizontal coal screens. The Krehbiel Co., engineers, of Chicago, have the contract.

Linton—The Coal Ridge Mining Co. is installing a coal preparation plant at the No. 1 mine. The plant is being equipped with modern horizontal screens and crusher. A substation is also being installed for furnishing direct current for locomotives.

ILLINOIS

Clinton—The wood tipple at the Keller Klondyke mine, three miles northwest of the city, was destroyed by an explosion on Feb. 27. The blast was of a peculiar nature, presumably a dust explosion. Such was the force of the explosion that the tipple was torn from its anchorage. A force of men was put to work immediately to rebuild the tipple. Splendid progress was made in the work of reconstruction, and at this writing 75 of the employees of the company have resumed work.

Carlinville—The first cage in the Berry mine, or more properly speaking, Mine 1-B, has been hung. The new equipment is being placed in position as rapidly as possible and the company hopes to begin hoisting coal on St. Patrick's Day.

Carlinville—The Standard Oil Co. made an excellent record at Mine No. 1 in February, the best which it has made since it took over the mine. The output was approximately 25,000 tons, which was hoisted in 24 working days.

Rutland—The tower of the coal mine here was destroyed by fire. About 75 men are idle as a result. The loss is covered by insurance.

Taylorville—The Peabody Coal Co. No. 9 mine at Callaway will be ready in about three months for the erection of the new top works, which will be of steel. The mine will be electrically equipped throughout.

Herrin—The Big Muddy Coal and Iron Co.'s mine No. 8 at Clifford is undergoing a thorough overhauling. An entirely new boiler plant is being put in and it is understood that a new washer will be built or the old one entirely remodeled. New motors and extensive work on the haulage system are also being installed. This mine has been idle for some time for repairs.

Maryville—The local record for hoisting coal in this district was broken on Mar. 3 when the Maryville mine of the Donk Brothers Coal and Coke Co., of St. Louis, hoisted 4265 tons of coal in eight hours. The state record, it is understood, is held by the Orient mine in Franklin County, which has produced 6000 tons in eight hours. The Maryville mine had 507 men, including 300 diggers, at work when the record was made.

Mascoutah—The old mine of the Kolb Coal Co. broke its coal-hoisting record recently by making 834 hoists, the old record being 785 hoists. This is the largest amount of coal ever taken out of this mine in one day, the actual hoisting time being seven hours. The coal was all caged and dumped by hand, as the old-fashioned stiff cages are still in use in the mine. This mine has been in operation for 24 years.

Collinsville—The annual convention of sub-district No. 7 of the Illinois Mine Workers will be held in the new Miners' Institute building here Mar. 18. Among the subjects to be discussed will be the six-hour mine day, the daylight saving law, the Mooney case and proposed changes in the safety measures for protection of miners.

Taylorville—Coal has been struck in two places in Mosquito township near here. One of the prospects is on the Emil Watts farm where it is said that seams of five and seven feet have been struck at a depth of 550 feet. The other is on the Loren Butterfield farm, where the conditions are about the same. The company developing the operations has options on 30,000 acres at $15 an acre.

Alton—The Gillettes, coal operators and cattle raisers of Logan County, have been making extensive purchases of coal lands in this vicinity with the understood purpose of doing development work on a large scale. About 1000 acres have been purchased at Miles station, for which about $150,000 is said to have been paid. The Gillettes utilize the surface for stock raising and therefore do not confine themselves to purchase of the coal rights. There are known to be good deposits of coal under the land which has been purchased.

IOWA

Des Moines—Iowa bituminous coal mines are being operated on an average of only two days a week. The failure of many railroads to take more than their minimum contract quotas and the unusually mild winter are given as the two underlying reasons for the condition of slack work at the mines. J. C. Lewis, of Albia, president of the Iowa mine workers, estimates that normally the railroads purchase 10 per cent. of all of the coal mined in the state. The mine workers state that some railroads which in other years used Iowa coal for operating in this state and Nebraska are now consuming Illinois coal and are carrying it into Nebraska for use in that state. It is said that five mines in one section which have a normal daily production of 3500 tons, previously used almost entirely by the railroads, now sell only 300 tons daily to the roads. More than nine million tons of coal were produced in Iowa in 1917, but several months of slack work cut down the 1918 production. The production for 1919 promises to be greatly under the 1917 yield unless there is a marked improvement in the situation. Many miners have left the state on account of the lack of work. Approximately 14,000 miners are employed in the state, and with an average of only two days' work a week they are earning about $10 a week. The slack work offered has proved to be a hardship to many miners and hundreds of them have been forced to part with their Liberty Bonds.

COLORADO

Boulder—Fire which started Feb. 28 in the Centennial mine of the Big Four Coal Co. at Louisville, near here, destroyed surface buildings of the mine. Six men who were inside when the fire began were rescued. The loss has not been estimated.

Aguilar—The new bathhouse of the Royal mine, near here, is proving a boon to the employees. The structure is of concrete, nicely painted, and accommodates 152 individual lockers. The bathhouse is electric lighted and is equipped with 14 showers and hot or cold water-steam baths. It is strictly sanitary, being thoroughly scrubbed and cleansed each day. The building was erected at a cost of $3000. The Royal Fuel Co., of Denver, Colo., which operates a number of mines, has constructed similar houses at its other plants.

Personals

Frederick J. Kandt, of Buckhannon, W. Va., has succeeded Mr. Slattery as Fairmont (W. Va.) manager of the Alden Coal Company.

W. H. Cameron has resigned his position of general manager of the National Safety Council to become manager of industrial relations for the Eastman Kodak Co.

Thomas Richardson, formerly with the Dilltown Smokeless Coal Co. at Dilltown, Penn., has accepted a position as superintendent with the Park Coal Co. at Leechburg, Penn.

C. C. Wallace, formerly manager of the loading of munitions section of the Stenotype Co., Indianapolis, Ind., is now director of development and service of the Powdered Coal Engineering and Equipment Co. of Chicago.

R. E. McLain has been made superintendent of the Peabody coal mine at Stonington, Ill., succeeding Mr. Anderson. Mr. McLain has been superintendent of the Hewittville coal mine for the past two months.

Calvin Horning, formerly mine foreman for the Rochester & Pittsburgh Coal and Iron Co., at Lucernemines, Penn., has been made superintendent of the Coy mines of the Brush Creek Coal Mining Co. at Homer City, Penn.

G. P. Blackston (L. W.) has resigned from the Koppel Industrial Car and Equipment Co., of Koppel, Penn., after having been with the company for nearly twelve years in the capacity of advertising and promotion of sales manager.

George K. Bell, special legal investigator of the Interstate Commerce Commission, has succeeded F. J. Patton, former secretary of the Northern West Virginia Coal Operators' Association. Mr. Bell's title will be that of executive vice president.

Henry T. Bannister, state mine inspector of Franklin County, with headquarters at Benton, Ill., has resigned to accept a position as production manager for the Madison Coal Corporation. His successor as state inspector will be **John O'Rourke,** who is the present county inspector.

Capt. A. U. Wetherbee, who recently received his discharge from the chemical warfare branch of the service, and who was formerly chief engineer and assistant works manager of the Niagara Alkali Co., has accepted a position as chief mechanical engineer with the Powdered Coal Engineering and Equipment Co. of Chicago.

J. William Wetter, chief engineer of the Clearfield Bituminous Coal Corporation at Clearfield, Penn., has resigned that position to become assistant general manager of the various mines in the Pennsylvania anthracite and bituminous fields and the West Virginia field of Madeira Hill & Co. Mr. Wetter will have his headquarters at Philipsburg, Penn.

C. W. Johnson has been appointed assistant manager of works of the Westinghouse Electric and Manufacturing Co. Mr. Johnson entered the employ of the company in 1907 as chief inspector of works. He is a member of the American Society of Mechanical Engineers, American Institute of Mining Engineers and Engineers' Society of Western Pennsylvania.

Henry D. Thompson, formerly superintendent for the Big Muddy Coal and Iron Co.'s properties at Herrin, Ill., has been appointed state mine inspector by Governor Lowden. It is expected he will be assigned to the Williamson and Franklin County fields. His father is the head of the Department of Mines and Minerals in the State of Illinois, succeeding the late Evan John.

C. W. Price, field secretary of the National Safety Council, was elected general manager of the society at a recent meeting of the executive committee, to fill the place made vacant by the resignation of **W. H. Cameron,** mentioned elsewhere in these columns. **Sidney J. Williams,** formerly manager of the accident prevention division was elected secretary and **F. W. Pardee,** formerly business manager, was elected treasurer.

Obituary

Edward H. Vitalius, chief engineer of the American Blower Co., Detroit, Mich., died Feb. 26 as a result of injuries received in a trolley wreck. Mr. Vitalius was well known as an expert in ventilation problems.

Coming Meetings

New England Coal Dealers' Association will hold its annual meeting March 19 and 20 at Worcester, Mass. Secretary, C. R. Elder, Boston, Mass.

Indiana Retail Coal Merchants' Association will hold its annual spring meeting Apr. 23 and 24 at Indianapolis, Ind. Secretary, R. R. Yeagley, Indianapolis, Ind.

National Foreign Trade Council will hold its sixth convention at the Congress Hotel, Chicago, Ill., April 24-26. Secretary, O. K. Davis, 1 Hanover Square, New York City.

Industrial News

Barnesville, Ohio—The Millwood Coal Co. has been chartered with a capital of $50,000 by Ellis G. Eyer, Robert G. Scott, E. M. Johnston, T. S. Lackey and James W. Bell.

Canton, Ohio—The Diamond Coal Co. has been incorporated with a capital of $25,000 by H. G. Winterhafter, L. P. Winterhafter, William I. Zink, Ray F. Harbert and William R. Thom.

Dayton, Ohio—The Robert H. Ball Coal and Mining Co. has been chartered with a capital of $150,000 by Robert H. Ball, James H. Anderson, John Gallagher, Sidney G. Kusworm and Alfred J. Goldshot.

Buffalo, N. Y.—The office of the Youghiogheny & Ohio Coal Co. will move from the Marine Trust Building to the Prudential Building. R. A. Kreuger, sales agent, has resigned to accept a more lucrative position. He will be succeeded by A. J. Kretchmar, from the office of the company in Cleveland.

Columbus, Ohio—Due largely to the opposition of organized miners, the bill introduced in the Ohio Legislature providing for the organization of a state constabulary was killed in the senate. At a recent meeting of sub-district No. 4, United Mine Workers, strong resolutions against the measure were adopted.

Hartford, Conn.—The Terry Steam Turbine Co. makes the announcement that since the death of Charles E. Hague in April, 1917, its interests in the Philadelphia district have been under the supervision of V. L. Sanderson, with headquarters at 605 Widener Building. James H. Weir has recently become associated with the concern as assistant to Mr. Sanderson.

New York, N. Y.—While no formal announcement has been made, it was stated at the Army offices that the Alden Coal Mining Co. would furnish 35,000 tons of coal for the transport service in New York harbor. Bids were opened here on Feb. 10 for supplying about 300,000 tons of coal at the rate of about 60,000 tons a month for five months. There were 20 bidders. The Alden Coal Mining Co. submitted bids on two delivery periods (Coal Age, Feb. 20, page 381).

Seattle, Wash.—The closing down of the shipyards in Seattle and vicinity through a general strike of the metal workers has caused an influx of men to the coal mines, which have been running short-handed several months because of the fact that many coal miners, attracted by higher wages, left the mines for the shipyards. This shortage before the close of the year was as high as 1200 men, but it has now been reduced to less than 200 men. The shipyards have been closed for two months.

Charleston, W. Va.—A total of $1,350,000 is said to have been the consideration involved in the transfer of ninety different tracts of coal land in Nicholas County from the Gauley Coal Land Co. to the new Gauley Corporation, this constituting a sale of the greatest magnitude so far recorded in Nicholas County. It seems likely that some of the coal in this acreage which has changed hands will be developed, as the Gauley company has deeded certain rights of way to the Kanawha & Michigan Railway Company.

Harrisburg, Penn.—Official figures placing the total value of all unmined coal in Dauphin County at $117,499,536 were submitted to the Board of County Commissioners on Mar. 3, by T. Ellsworth Davies, of Scranton, mining engineer, who has completed a survey of the Lykens coal fields in this county. At present the coal field valuation for this county is assessed at approximately $1,000,000. If the new valuation will stand in many little mining towns of a hundred or so population, the tax collectors of the same will receive from $5000 to $19,000 in commissions.

St. Louis, Mo.—Walter A. Zelnicker, president of the Walter A. Zelnicker Supply Co. and affiliated companies in St. Louis, has appointed Cline B. Finnell as his private secretary. Mr. Finnell, who recently returned from the Officers' Training School at Camp Pike, Ark., was formerly traveling secretary to the general superintendent of the Chicago, Burlington & Quincy R.R., and later private secretary to Clarence H. Howard, president of the Commonwealth Steel Co. Mr. Finnell is president of the Junior Chamber of Commerce of St. Louis, an organization of 1000 members of younger business men of the city.

Columbus, Ohio—F. S. Davidson, who has been connected with the West Virginia Coal and Coke Co. for several years in the capacity of office man, has resigned to become sales manager of the Pittsburgh & Bessemer Coal Co., of Pittsburgh, which will establish sales offices in Columbus. The Columbus office will be located in rooms 322-323 Columbus Savings and Trust Building. The company controls the Kehota Mining Co., which has a stripping operation in the Hocking Valley. Curtis T. Posten, formerly with the Consolidation Coal Co. as a traveler, has taken the position of M. Davidson with the West Virginia Coal and Coke Co.

Pittsburgh, Penn.—The Vesta Coal Co. has made announcement that work has recently been completed on the construction of the company's marine way on the Monongahela River, at Floreffe, about 24 miles from Pittsburgh. The new ways are of concrete, the six cradles being of steel, with length sufficient to hoist a 250-ton and a 150-ft. barge at one time, end on end. Seven platforms have also been constructed, providing enough space to accommodate barges of the above-named length or four towboats at one time. The equipment at the new marine ways is electrically operated throughout wherever possible. The company is a subsidiary of the Jones & Laughlin Steel Co.

Quincy, Ill.—The Dayton-Dick Co., manufacturer of centrifugal pumps, has changed its name to the Dayton-Dowd Co. The change was made owing to changes in organization. Capital has been doubled and the business placed directly under the control of those immediately interested. Facilities are greatly extended. The company has recently received many orders for large irrigation and drainage pumps, and it can now build any size from 1½ in. to 30 in. in a split-casing type of pump. It has developed a complete line of fire pumps, complying with specifications of the various underwriters' boards. Furthermore, it has developed high-pressure and hydraulic pumps for boiler feed, elevator pumps and similar high-pressure service, and these lines are to be pushed to the utmost.

Fairmont, W. Va.—There will be no further delay in completing the plant of the Domestic Coke Corporation, capitalized at $5,000,000. A little less than a year ago this concern was organized by people identified with the Monongahela Valley Traction Co. in coördination with the Government not only for the purpose of manufacturing byproducts but also explosives for the Government as well. Upon the signing of the armistice construction work ceased, the Government having no further use for the product of the plant; but it became necessary to determine the Government's financial responsibility before work proceeded further on the plant. Government accountants having audited the accounts of the company, orders have been received from Vice President C. F. Critchfield of the company to proceed with construction work. In accordance with such instructions the battery of 60 byproduct ovens which will become the first unit of the plant will be finished at the earliest possible date at a cost of about $3,000,000, each byproduct oven to cost $50,000. The ultimate cost of the plant will be $5,000,000.

MARKET DEPARTMENT

Weekly Review

Improvement Is Evident in Bituminous Situation—Prices Being Maintained, the Best Grades Having Gone Up—Production of Soft Coal Increases—Anthracite Situation Unsettled—Higher Price Schedule Announced

SIGNS are not wanting that the bituminous coal market is now on the mend, and both prices and production are already beginning to reflect the change in conditions. Coals of good quality are not being sold at less than the recent Government prices, and operators, as a rule, are adhering closely to their policy of producing only what the market will absorb. One of the many indications that the soft coal market is settling down to a normal basis is the fact that the special grades of bituminous coal command much higher prices than they did during the period of Government control. Inferior coals are finding it more difficult to obtain a market, buyers in the majority of instances exercising the keenest sort of discrimination. They have had a sorry experience with poor coal.

Needless to say, operators in all the producing districts are watching the current market conditions closely. Efforts are many to close contracts for the next coal year—Apr. 1, 1919, to Mar. 31, 1920—but no agreements involving any considerable tonnage have been reported.

The continued drop in the output of soft coal for the last six weeks was checked during the week ended Mar. 1 by the production of 8,088,000 net tons, an increase of more than 363,000 net tons over the output for the week ended Feb. 22. As compared to the production of the similar period in 1918, however, this is a drop of 3,519,000 net tons. Total production of soft coal for the coal year to date is 525,517,000 net tons, 20,168,000 net tons in excess of the output for the same period of the preceding coal year. It is recognized that March will be another light month for tonnage, but orders are more numerous than they were a week or two ago. If the situation continues to show the same signs of improvement for another month or so, without the injection of labor troubles at the mines, the soft coal industry will have passed undemoralized through its readjustment period.

"Unsettled" is the word that best characterizes the present condition of the anthracite industry. Even with the mines working only half time the operators find it difficult to dispose of their output. Instead of the decrease in prices loudly heralded in some quarters, the announcement has been made that beginning with May 1 there will be an increase in the price of domestic anthracite of 10 cents a ton each month until a maximum increase of 50 cents a ton is reached on Sept. 1. The so-called "independent" companies will increase their prices during the same period 15 cents per ton, making the maximum for independent coal 25c. higher than for company coal on Sept. 1.

The production of anthracite during the week ended Mar. 1 is estimated at 1,102,000 net tons, a slight decrease over the preceding week's output, but 834,000 net tons lower than the production during the corresponding week in 1918. The total output of anthracite for the coal year to date is 87,122,000 net tons.

WEEKLY COAL PRODUCTION

For the first time during the past six weeks improvement occurred in the output of bituminous coal during the week ended Mar. 1, preliminary estimates placing the production at 8,088,000 net tons, compared with 7,715,000 net tons during the week ended Feb. 22. This increased output, however, is 3,519,000 net tons below the output of the week of Mar. 1, 1918. The average production per working day during the current week is estimated at 1,348,000 net tons, as compared with 1,825,000 net tons for the coal year to date, and 1,755,000 net tons for the same period of last year. Total production for the coal year to date totals to 525,517,000 net tons, and is now but 20,168,000 net tons in excess of the output for the period Apr. 1, 1917, to Mar. 1, 1918.

The production of anthracite in the United States during the week ended Mar. 1 is estimated at 1,102,000 net tons, and while a slight decrease compared with the production of Feb. 22, falls far behind production during the corresponding week of last year when the output was recorded at 1,936,000 net tons. For the coal year to date production of anthracite is estimated at 87,122,000 net tons, as against 91,173,000 net tons for the eleven months ended Mar. 1, 1918.

Carrier's reports for the week ended Mar. 1 show that improvement occurred in all districts with the exception of central and western Pennsylvania and southwestern Virginia. The decreases that occurred in these fields were slight, while the increased loading which occurred in Ohio amounted to 758 carloads, in the southern West Virginia field to 1756 carloads and in the Illinois, Indiana and Western Kentucky fields to 2765 carloads.

Bituminous coal shipped to New England during the week ended Mar. 1 is estimated at 238,885 net tons, and is a slight decrease compared with the week preceding. Shipments by rail were in excess of those of the week preceding, while tidewater shipments fell approximately 14,000 net tons. No tonnage was loaded at Baltimore during the week.

Shipments of bituminous coal from the North Atlantic ports and Hampton Roads to all points during the week ended Mar. 1 are estimated at 567,782 net tons, a decrease compared with the week of February 22 of 24,715 net tons. The coal moved from New York and Philadelphia, estimated at 305,217 net tons, was 46,235 net tons behind the week of Feb. 22, while the tonnage moved from Baltimore and Hampton Roads exceeded that of the preceding week.

Production of beehive coke in the United States during the week ended Mar. 1 is estimated at 436,365 net tons, as against 445,692 net tons during the week ended Feb. 22 and 621,482 net tons during the corresponding week of 1918. During the current week production in Pennsylvania, West Virginia, Virginia and Kentucky fell behind that of the week preceding, while production in the other states was in excess. Compared with the same week of 1918, however, the current week's production in all states falls far behind. The daily average per working day during the week of Mar. 1 is estimated at 72,727 net tons, and is considerably lower than the daily average for the calendar year to date, estimated at 83,418 net tons, and the daily average for the same period of last year, estimated at 89,780 net tons. Pennsylvania is the lone state reporting production, for the calendar year to date, in excess of last year.

BUSINESS OPINIONS

Marshall Field & Co.—Current wholesale distribution of dry goods is running slightly less than for the same week of 1919. Road sales for at-once delivery also were less compared with the same period last year. Few customers were in the house. Collections continue normal.

Dry Goods Economist—One of the factors which have much to do with the lessened production of all textiles is the unrest of labor. In the cotton mills of New England, the woolen mills of New Jersey and other states, and the silk mills of New Jersey and Pennsylvania, as well as in the knitting mills in and around Cohoes, N. Y., the demands of labor have been such as to curtail production or to increase its cost. In the women's garment industry, strikes have also been a deterrent to normal production, but have not had the effect of retarding business to any marked degree.

Bradstreet's—Conservatism and caution still dominate the general trade situation, but absolute necessity buying and the advance toward spring are visible in the reports of a larger volume of buying at both primary and secondary markets, northwestern and large southern cities sending best reports. Industry, except in a few lines, and these chiefly textiles, also shows a slightly better pace, and many readjustments appear to have been satisfactorily completed. Perhaps the most notable advance, industrially, visible is the swelling of the building trades into a modified form of preparatory activity after over a year of dullness and depression and even starvation treatment forced by war necessities.

The Iron Age—Producers are, if anything, more outspoken in the expectation that labor readjustment will be necessarily long delayed. This and the commonly overlooked fact that this country's industry will not move independently of the rest of the world promise little in the way of drastic price revisions. February's production of pig iron was 2,940,168 tons or 105,006 tons per day. This is 1519 tons less than the daily output of January. On Mar. 1 there were 306 furnaces in blast making iron at a rate of 101,475 tons daily, against 323 furnaces on Feb. 1, operating at 104,405 tons. In the month improved furnace operation was obtained, due probably to better coke. One group made 4000 tons more in the 28 days of February than in the 31 days of

January, notwithstanding there was a net loss of four furnaces in blast by Mar. 1.

American Wool and Cotton Reporter. From orders taken on woolen goods offered in New York, good business seems to be in prospect for the woolen mills. The worsted mills are generally keeping out of the market on account of the labor situation and the lack of choice wools, but a few orders have been received from them. The opinion is expressed that wools from the Middle West which were 65 to 70c. last year will open at 50c., this year. Others feel that prices will be about 50 per cent. of what they were a year ago. News from the South in regard to reduction in cotton acreage is attracting close attention. Although previous attempts have not met with any degree of success, it would seem as if this year efforts will be more effective than they have in the past. Opinion is divided as to to the ultimate result of the strenuous efforts to reduce acreage, both among manufacturers and also in the South. Mill demand for cotton has been small.

Atlantic Seaboard

BOSTON

Signs of a better tone. Transient demand improves all-rail, although tonnages are small. Prices show firmness. Contracts offered, and in some instances accepted. Operators watch market closely. Shipping Board withdraws all rates and will return steamers to owners. No activity on Hampton Roads coals, and none looked for until June. Contracts offered by rehandlers for points inland. Anthracite dull except for scattering demand because of lower water rates. Railroad-owned barges at disadvantage. Rail movement slopes off. More confidence in mine prices.

Bituminous—Unmistakably there are distinct signs of an improved situation. The change is extremely slight, but there is a more hopeful undertone than has been apparent the past 60 days. Things are beginning to settle, if ever so little, and each week now brings us nearer a season basis. The big news this week is the reopening of a competitive market on marine freights, and this will go far to restore confidence in the trade for the new coal year.

Inquiry for spot coal, or rather for transient lots, has improved noticeably the past week. The tonnages are small, but in the aggregate amount to a considerable volume, and are the source of much encouragement to all-rail shippers who are practically without competition from tidewater distributors. Small steam-users and retail dealers have in a great many cases worked off their surplus stocks that were accumulated last season, and now that high grade coals are to be had on short notice there is already a consistent demand from all parts of the territory. Many got into the habit of not buying, and yet the supplies of bituminous, even though mongrel in quality, have been gradually absorbed and stocks need replenishing. We look for an increasing demand of this character, as the outlook becomes more settled and definite.

Prices have already begun to reflect the change in conditions. Most of the quality grades are being held firmly at the recent Government figure, namely $2.95 per net ton f.o.b. mines in Central Pennsylvania. Occasionally this price is shaded to provide spot orders, but as a rule the operators are adhering to their policy of producing only what the market will absorb at what they consider to be a fair price. A few of the special grades are commanding higher levels, and it is one of the many indications that the market is resuming normal conditions that there is today almost an increasing differential between these and the inferior coals. The latter are druggy at prices not very much in excess of $2 per net ton, and without doubt buyers in New England are discriminating more than it has been their privilege to do for the past three years.

Progress has also been made in the tidewater situation. Just at the moment when New England industries were beginning to focus a widespread campaign to impress the Shipping Board with the great need of changing steamer rates on the coast the announcement was made, on Mar. 6, that effective that day all rates were withdrawn and that individual ship-owners and charterers were free to agree upon their own rates in the open market.

No activity in coals from Hampton Roads is expected in this market until June at the very earliest. Curtailments in manufacturing have considerably lengthened the period first estimated, and the railroads, too, because of extremely light traffic, are by no means using their normal tonnage of coal.

The only contracts being made today on the Southern coals are by producers who also own rehandling plants at tidewater for distribution inland. These are based upon $2.35 per net ton f.o.b. mines for Pocahontas, plus charges, and are being entered into by those who secured good service from the distributors last season and are convinced that Pocahontas, for instance, is worth a considerable differential over such Pennsylvania coals as are accessible all-rail and can be depended upon for regular deliveries.

Bituminous at wholesale is quoted about as follows, f.o.b. mines and at loading ports, per gross or net ton as designated:

	Clearfields	Cambrias and Somersets
F.o.b. mines, net tons	$2.05@2.75	$2.80@3.20
Philadelphia, gross tons	4.15@4.90	5.00@5.45
New York, gross tons	4.50@5.25	5.35@5.80
Alongside Boston (water coal), gross tons	6.00@6.85	6.90@7.80

Georges Creek is quoted at present only f.o.b. mines for this territory—namely $3.20 per net ton—and its use is being confined to smithing purposes.

Pocahontas and New River are quoted at $4.70 @5.25 f.o.b. Norfolk and Newport News, Va., for spot coal, and $7.20 @ $8.60 alongside Boston, these prices being on a gross-ton basis.

Anthracite—The market for domestic sizes continues generally dull. Lower water rates from New York to points on Long Island Sound and to Boston have caused a scattering demand, however, since retail dealers feel that $1 freights to Providence and $1.25 to Boston may not continue indefinitely. There is no doubt about there being a surplus of tonnage and a great surplus of all the popular sizes at all the loading piers. In fact, it is stated that several of the larger companies have been embargoed because of their inability to move accumulations at the different New York loading ports.

Rail movement of domestic sizes has sloped off materially the past fortnight. Retail distributors know that any size or kind can be had on short notice, and there is also a disposition to wait until through tariffs are adjusted. There are many points in New England where coal originating on certain roads has the benefit of a differential that ranges from 30c.@50c. a ton. It is notable, however, that buyers have more confidence in prices and there seems to be a well-defined sentiment now that the present program attributed to the anthracite companies will carry through.

Current prices per gross ton f.o.b. New York loading ports rule as follows on company coal:

Egg	$7.80@7.95
Stove	7.95@8.15
Chestnut	8.05@8.35

NEW YORK

No change to be made in anthracite prices on Apr. 1. Ten cents per ton to be added for five months. Some tradesmen disappointed and retail dealers do not expect a large summer business. Demand continues slow. Buyers willing to take small cargoes to tide them over. Anthracite steam coals stronger. Better tone in bituminous situation and prices stronger. Tidewater surplus in good shape. Many inquiries regarding contracts.

Anthracite—The announcement that there would be no discount in the mine prices of the domestic sizes of anthracite on Apr. 1 was no surprise to the local trade, it having been anticipated for several weeks back that because of the high wages paid to the mine workers the operators would not make the usual April reduction of 50c. per ton. Accompanying the announcement was another that beginning May 1 prices would advance 10c. per ton for five months which means that on Sept. 1 prices for the domestic coals will be 50c. higher than they now are. It was reported that independent operators would add 15c. per ton for five months to their price.

Retail dealers are slowly cutting their stocks and some have come into the market for small cargoes of certain sizes to fill in the gaps. As an inducement to prevent an accumulation at the tidewater docks it is reported that shipments made early this month were made on the basis of prices to be quoted by the producers on Apr. 1. Even this opportunity to replenish their stocks failed to cause a heavy movement. Company product is being held firmly at full prices while bargain seekers have been able to pick up stray lots of so-called Independent coals at about 20c. below.

The slowing down of the washeries adds strength to the steam coal situation. These sizes are not so plentiful and prices are a trifle stronger. Prices at the mine ranged from $3 to $3.25 for buckwheat No. 1, $2 to $2.35 for rice, and $1.35 to $1.80 for barley, all of the better grades.

Dumpings of anthracite for the week ended Mar. 7 were 2414 cars, as compared with 2962 cars the week previous, a decrease of 546 cars.

Current quotations, White Ash, per gross tons, f.o.b. Tidewater, at the lower ports are as follows:

	Mine	Company Circular
Broken	$5.95	$7.80
Egg	5.85	7.70
Stove	6.10	7.95
Chestnut	6.20	8.05
Pea	4.80	6.55
Buckwheat	3.40	5.15
Rice	2.90	4.65
Barley	2.40	4.15

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—A better tone exists in the local market following the cleaning up of much of the surplus coal that was here a few weeks back. However, the situation is not entirely satisfactory. More of this loose coal must be got rid of before it will be safe for unsold product to be sent forward.

The Tidewater Coal Exchange reported that on Mar. 5 there were on hand at the New York docks 2715 cars of coal as compared with 6119 cars on Feb. 5. Precaution against a reoccurrence of an oversupply of coal at this tidewater was taken by the placing of embargoes against shipments as soon as the strike in the harbor was declared, with instructions that they be lifted as soon as the strike was off.

Consumers here are using their reserve stocks and the longer the demand remains slow the greater will the demand be when the reaction comes. There is no great urgency on the part of the wholesale dealers to dispose of their wares. They feel that consumers will soon come into the market of their own accord. A heavy demand is looked for when the reaction does set in, and this is likely to create higher prices.

Operators are not letting their coal go at low prices, just for the sake of keeping it on the move. Most coals are bringing substantial figures at the mine but are much easier at Tidewater based on the mine price. Coal in Pools Nos. 10 and 11 were heard quoted recently at from $2.30 to $2.50 on the mine price basis, while Pool No. 18 coals in loaded boats were quoted at from $3.65 to $3.95.

One bright feature is the resumption of inquiries for contract coals. Many more queries are now being received and prices based on twelve-month shipments have been quoted. In some instances these figures are practically the same as those quoted for spot coal at the mine, but in most instances show a substantial increase.

The report of dumpings at the local docks for seven days ending Mar. 7 show 4201 cars of bituminous coal dumped as against 5017 cars the week previous, a decrease of 796 cars.

The following are current quotations on the various grades of bituminous coals, at the mines, for spot delivery and contract:

	Spot	Contract
South Forks	$2.90 to $3.50	$3.10 to $3.50
Cambria County (good grades)	2.80 to 3.10	2.95 to 3.10
Clearfield County	2.65 to 2.95	.....
Reynoldsville	2.65 to 2.95	2.85 to 3.00
Quemahoning	2.85 to 3.10	2.95 to 3.10
Somerset County (best grades)	2.80 to 2.95	2.95 to 3.10
Somerset County (poorer grades)	2.50 to 2.75	2.75 to 2.95
Western Maryland	2.50 to 2.75	2.65 to 2.85
Fairmont	2.00 to 2.35	2.35 to 2.50
Latrobe	2.25 to 2.40	.....
Greensburg	2.35 to 2.40	.....
Westmoreland ¾-in.	2.60 to 2.75	2.65 to 2.75
Westmoreland run-of-mine	2.40 to 2.65	2.40 to 2.65

PHILADELPHIA

Anthracite spring price plan announced. Present circular to May 1. Ten cents increase each month to Sept. 1. Little increased buying. Prices vary. Some consumers show desire to put in spring coal, but dealers expect dull summer. Retailers think pea price a mistake. Price cutters reduce pea. Individuals have much coal on demurrage. Some contract inquiry. Bituminous in poor condition. Trifling contract business. Railroads buying on monthly basis.

Anthracite—On Mar. 6 one of the largest operating companies announced its price policy for the spring. While the plan as

decided upon was far from being a surprise, yet the early date of its announcement caused much comment. It was believed that any price announcement would be deferred until the last minute before Apr. 1. As announced the present circular prices will remain in effect until May 1, on which date 10c. per ton will be added to the present figures, increasing the same amount each month until Sept. 1, when the maximum increase of 50c. per ton will be reached and will continue in effect for the winter. The new schedule includes all of the sizes from broken to pea inclusive. Up to this time no action has been taken in regard to the steam sizes.

With the lead being taken by the big companies the smaller concerns naturally fell into line with practically the same terms as to prices. As a matter of fact many of the individual shippers had been trying to force sales for the past two weeks by offering to ship coal, guaranteeing to protect the dealer in the event that there should be a decline in April prices. In the case of one of the larger individual shippers announcement was made that they would increase their prices 15c. per ton for five months, which would bring their coal to a point 25c. a ton higher than the company shippers by Sept. 1. On the other hand, another individual shipper circularized the trade offering to ship egg and pea coal during this month and April at 20c. less than the present so-called circular prices. On stove and nut coal they still ask the full price.

Regret is expressed that the price of pea coal has not been revised, and it is held that even buckwheat should share in a downward revision. Pea never can sell at the present high rate and the operators realize it. The price is too near that of chestnut and cannot hold. Pea is at present stocked in greater quantities in the dealers' yards than any of the other family sizes. It has been the main point of attack by three or four notorious price cutters. This week saw its lowest level for many months when one firm turned its wagons into the streets displaying large signs announcing a reduction to $8 per ton. This is for 2240 lb. it must be remembered.

The individuals continue to be worried with coal standing on demurrage and the coal is being sacrificed. We have heard of sales being made in some instances at 30, 40 and 50c. off circular. Much depends on the conditions prevailing at the time and the reputation of the coal. Not a whisper is heard of any of the larger companies cutting prices.

There is some interest stirring in the contract situation, for the limited number of contracts made by the companies last year mostly expire on Apr. 1, and the consumers are making inquiry as to the price likely to be effective after Apr. 1. What few contracts were taken a year ago were with particularly large users, such as public service plants. This year, with a large surplus of all the sizes smaller than buckwheat accumulating, it would seem that contracting would become much more general. While the present spot price of buckwheat is $3.40, many individual shippers are known to have made sales at $2.75 and in between that figure. The gas companies using broken and egg coal are also coming into the market for the renewal of their contracts and some idea of the prices of these sizes can be obtained from the circular prices of these sizes just announced. It is believed that there will be considerable competition for the business on both the small steam sizes, as well as broken and egg.

The price per gross ton f. o. b. cars at mines for line shipment and f. o. b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	$5.95	$7.30	Buckwheat	$3.40	$4.45
Egg	5.85	7.20	Rice	2.90	3.80
Stove	6.10	7.45	Boiler	2.70	3.70
Nut	6.20	7.55	Barley	2.40	3.30
Pea	4.80	6.05	Culm	1.25	2.15

Bituminous—There is not the least sign of a change in the bituminous market. Little coal is moving and as a consequence the business is far from profitable, with the mines working on a short schedule. While some of the larger companies have expressed a willingness to contract at a figure around $3.50, it can safely be said that there is only a slight tonnage likely to be closed at this price. The producers seem to have based this price on some profitable bunker business which they have been able to close. The railroads are buying their requirements on a monthly basis, asking for bids for each month's requirements.

BALTIMORE

Bituminous market poor; growing demand of spotty nature. Hard coal men await April and figure on plans for next coal year.

Bituminous—The soft coal market is poor, with each handler developing a quiet line of new inquiry. The call is for small lots for the most part, but the fact that there is a resumption of call, even in spotty form, from customers who have been out of the market for some time, is encouraging.

There is a determination on the part of the mine operators not to sell at a loss except when caught on some particular shipment. Thus it is that the quotations at the mines are for the most part much higher than some of the sales, mine basis, at tide. The irregular arrival of vessels here has added to the necessity at times of coal being sacrificed. The Shipping Board coal, too, had clogged the port and was forced out for all foreign bunker trade, but this is rapidly clearing now and leaving an open sale market. It is rather difficult to quote sales prices under the circumstances. Very best coals, except for one particular line that is held at $3.20, are selling for the most part around $2.75 to $3. Good coals, in fact excellent coals at times, are to be had at from $2.60 to $2.75. Poor to fair coals are running all the way from $2 to $2.50. Gas coals are below even the $2 mark here at tide under forced sales at times.

The trade is discussing the report that the entire Tidewater Exchange is to go out of business on Apr. 1. Such a plan, while possibly favored by a few big shippers, is hotly opposed by the majority of small handlers who say that the heavy demurrage charges and short free time allowed will not enable them to do business successfully except in some method of quick dumping and quick securing of coal for waiting bottoms. It is planned to urge some other plan for interchange of coal to prevent demurrage of ruinous nature should the Tidewater Exchange be ended.

Anthracite—Hard coal men are simply awaiting Apr. 1. No effort has been made to cut prices here to induce buying in the market where consumers are taking but small lots to tide over the balance of winter. The various reports in the trade of a spring schedule that will start off at the present price, with a 10c. increase per month after Apr. 1 is arousing much interest.

Lake Markets

PITTSBURGH

Market drags, but no weaker. Production 25 to 30 per cent. Steel industry revival in prospect.

The coal market has continued to drag, but there are no signs of increasing weakness on the part of operators. Production is running at 25 to 30 per cent. of capacity, and the continued curtailment is having a beneficial effect upon the situation. Stocks of coal have been reduced materially, despite the lower rate of consumption, and heavier requirements on the part of consumers are in near prospect.

Steel mill operations have deceased slightly in the past week, and are marked for heavier decreases in the next few weeks, as buying has been particularly light since it became generally believed that prices would have to decline. Secretary Redfield's plan for price deflation was unanimously adopted by trade representatives at a meeting in New York, and by Apr. 1 greatly reduced iron and steel prices will probably be in effect, stimulating buying and bringing about heavier mill operation. The steel producers will insist upon a wage reduction in connection with the reduced selling prices and it is possible they will propose that reductions be sought in the materials they buy, such as coal.

Demand for byproduct coal keeps up very well, as the byproduct coke ovens are operating almost full. Decrease in coke demand has fallen, and will in future fall, chiefly upon the beehive ovens.

Demand from retail dealers has continued poor, domestic consumption being light. Scarcely any coal has been used as a substitute for natural gas in the home the past winter, as the domestic gas supply has been practically adequate.

The market remains fairly firm at $2.25@2.35 for steam mine-run, with 1¼-in. domestic at but little more, and ¾-in. gas coal at $2.50@2.70 depending on grade, all per net ton at mine, Pittsburgh district.

BUFFALO

Not much improvement. Both anthracite and bituminous dragging. Some towns heavily loaded with coal.

Bituminous—The situation is about as unfavorable as ever. The supply of coal is still in excess of consumption. This is especially unfortunate, as it is now time to make spring contracts and nobody has much idea as to what prices will be.

The bituminous market is quite as steady as the light demand warrants, quotations remaining on the old Government basis of $4.65 for thin-vein Allegheny Valley, all sizes; $4.45 for Pittsburgh and No. 8 lump; $4.20 for some mine-run and slack; $5.65 for smithing and smokeless, $5.60 to $6.10 for cannel, all per net ton, f.o.b. Buffalo.

Anthracite—The only new feature of this branch of the trade is that the lake-shipping companies are taking tonnage quite liberally and already some cargoes have been loaded. There is no demand for the coal at upper-lake ports, but coal began to accumulate here so fast that something had to be done with it.

The demand is light. Some colder weather has set in lately, but the season is too far gone to be affected by a drop in temperature that cannot now last any length of time. The consumer is buying only from hand to mouth. Natural gas can again be used in furnaces on the 15th, and is preferred to coal generally.

Anthracite prices are as follows in the city:

	F.o.b. Cars, Gross Ton	At Curb, Net Ton
Grate	$8.55	$10.35
Egg	8.45	10.20
Stove	8.70	10.10
Chestnut	8.80	10.50
Pea	7.00	9.05
Buckwheat	5.70	7.75

An addition to the car prices of 25c. per ton is made on coal loaded into lake vessels.

CLEVELAND

Steam-coal users appear to have lost interest. Lake shippers looking for announcement restoring five days' free time on cars at Lake Erie ports, thus making possible abandonment of Great Lakes coal pool.

Bituminous—Contrasted with the slight impetus given the market last week by the interest shown by several large steam-coal users, the present lull—or rather the recurrence of the one that has abided for the last three months—seems all the more pronounced. The slight picking up all around last week proved a snare and a delusion. The "feelers" put out by several interests proved short-lived, even for "feelers," and virtually no buying has resulted.

The weather continues mild, and retail dealers cannot get away from the post. Many dealers are inclined to accept the present stagnant market as "part of the game," but are more pessimistic when figuring that the open winter will permit many consumers to start next winter with bins fairly well supplied. Pocahontas lump at $7.50 and mine-run at $7.20 are not proving alluring because of the weather.

Anthracite—Domestic consumers can now have all the egg they want at $10.85 and chestnut at $11.05, but the takers are few.

Quotations on coal in Cleveland in net tons, delivered, are as follows:

Anthracite:		Steam Coal:	
Egg	$10.85	No. 6 slack	4.60
Chestnut	11.05	No. 8 slack	4.95
Pocahontas:		Youghiogheny:	
Lump	7.50		4.95 to 5.05
Mine-run	7.20	No. 8 ½-in.	5.55
Domestic Bituminous:		No. 6 mine-run.	4.60
West Virginia splint	7.15	No. 8 mine-run.	4.95
No. 8 Pittsburgh	6.35		
Massillon lump	7.10		

Lake Trade—Nothing official has come out of Washington so far, but it is understood that the United States Railroad Administration will shortly amend demurrage rules so as to permit the abandonment of the Great Lakes pool and let lake shippers and upper dockmen get back to the old indivdual buying basis. Free time at Lake Erie ports now is limited to three days. Formerly it was five days, and before that seven days. It is felt that the five-day free time limit will be evoked again. This is the outstanding development in the lake trade since the close of last season, inasmuch as all concerned are anxious to forsake pooling.

DETROIT

Sales of bituminous coal in the Detroit market are still restricted by abnormally large stocks in the hands of buyers.

Bituminous—Demand for bituminous coal in the Detroit market falls far short of the volume of business handled at this season in preceding years. Jobbers and wholesalers report that it is a difficult task to interest buyers, though the high-grade coal they are now able to offer includes the product of several districts that could not be obtained in Detroit while the Government's zone regulations were in operation.

The predicament of the retail dealers arouses sympathy of the jobbers and wholesalers. A large proportion of the retailers are holding heavy stocks of bituminous, bought in complying with recommendations of the fuel administration and with the expectation that the greater part of their customers would be unable to obtain other forms of fuel. The dropping of various restrictions made it possible for the customers to use coke and later obtain additional supplies of anthracite. Weather conditions, also, failed to stimulate demand and it is probable the dealers will have to carry heavy stocks through the summer.

The Government scale of prices is still being maintained on practically all the local business, the jobbers say, though it is admitted a few sales of slack have been made at a lower price to escape railroad demurrage.

Anthracite—The receipts of anthracite, though not of large volume, are said to be sufficient to provide for domestic requirements. Some of the dealers are reported to have made attempts to reduce delivery on orders previously given. There is also a plentiful supply of domestic coke.

COLUMBUS

The coal trade in Ohio continues rather quiet. More activity has developed in domestics as a result of lower temperatures. Steam business is still slow, but reports show that many consumers are cleaning up and will soon be in the market.

Little change has taken place in the Ohio coal trade during the past week. Buying is still limited to actual needs and there is no disposition to buy for the future. Purchasers are still playing a "waiting game" so to speak, and are only placing orders for current needs. The tone of the market is not good although some increased activity is noted in certain localities. There are a larger number of inquiries received showing a disposition on the part of purchasers to talk fuel.

The domestic trade is probably the most active. Colder weather which prevailed early in March caused a small spurt of buying on the part of retailers. Dealers stocks are not large and there is a general disposition to clean up. Demand for Pocahontas and other fancy grades is fairly good under the circumstances. Retail prices are generally well maintained and instances of cutting are rare. Dealers in northern Ohio and Michigan are fairly well stocked up and are not in the market to any extent. It is ascertained that the amount of coal that will be carried over by householders is not as large as was generally supposed. While the winter has been a mild one, coal consumption has been higher than was generally believed.

The steam business is quiet in every section. Larger consumers are cleaning up preparatory to the expiration on their contracts. Screenings are the weakest feature of the market. Railroads are now taking a larger tonnage as a result of recent orders of the Railroad Administration. These orders provided that a larger fuel tonnage must be purchased for current needs and reserve stocks shall not be depleted as rapidly as formerly.

LOUISVILLE

Weather conditions approximately the same, with demand for domestic and steam generally quiet. Conditions at mines showing no material change. River coal moving more freely.

The general tone of the coal trade is approximately the same as it has been, with domestic not quite so keen, probably, and at the same time just a slight shade of improvement in steam demand. Nothing much can be expected of domestic under such weather conditions, and steam cannot possibly improve materially until heavy industrial stocks are lowered.

River coal is again becoming a factor. The Pittsburgh Coal Co. last week received a ten-barge shipment from the West Virginia fields, this being the largest shipment to come in to one concern in many months. It is said to be the forerunner of heavy shipping later on. However, the river companies are taking full advantage of the rail rates, which noes not make such coal profitable to many retailers.

From the best information available it would appear as though eastern Kentucky prices for the various fields are on a par level at the present time. These prices are as follows, per net ton:

	Eastern Kentucky	Western Kentucky
Block and egg	$2.85@3.00	$2.60
Mine-run	2.40@2.50	2.35
Nut and slack	2.00@2.10	2.05

These are fair prices, although there is some cutting being done. Some eastern Kentucky block and egg is selling at around $2.65, and some nut and slack at as low as $1.85 to $1.90; with some mine-run at $2.20.

Western Kentucky is striving to hold prices, as western Kentucky prices were already so low that coal could not be mined profitably at less per ton. However, eastern Kentucky in order to meet the competition on the lower grade western Kentucky has been cutting prices more or less.

BIRMINGHAM

Market conditions quiet, with little demand for steam fuel. Domestic trade has also eased up as result of warm weather. Prices remain stationary. Production curtailed 25 to 30 per cent.

The past week has not shown any improvement in trade conditions here, and steam coal is in slight demand. Cotton mills, brick plants and industries generally are either idle or operating on reduced schedules, and stock accumulations are keeping them out of the market. Railroads and other interests having contracts are not taking the maximum deliveries in many instances. There is a fair demand for blacksmith coal, which is not produced to any great extent by the mines in this district. Prices have not been affected by the soft trade conditions and are being maintained on basis of Government schedules for steam grades, quotations being as follows per net ton mines:

	Mine-Run	Prepared	Slack and Screenings
Big seam	$2.45	$2.75	$2.40
Black Creek and Cahaba	3.45	3.75	3.05
Jagger-Pratt Corona	2.85	3.05	2.45
Blacksmith	....	5.25	....

Domestic quotations, slightly increased, are as follows:

	Lump and Nut
Black Creek and Cahaba	$4.50
Corona	3.75
Jagger	3.50
Montvallo	5.00

Continued warm weather has caused a falling off in the demand for domestic grades, though there is ample business available to absorb the output of the mines at this time.

Coal production is lagging in about proportion to the requirements of the trade and is on a basis of 70 or 75 per cent. normal.

Coke

CONNELLSVILLE

March adjustments on contracts. Spot market lower.

Adjustments of prices for March shipment of furnace coke on contracts that call for periodic settlement of price when there is no Government price have practically all been made. One contract was adjusted at $4.50 for the month, but the usual settlement has been at $4.25. These settlements are not altogether conclusive as to market values, however, for two reasons. In the first place, contract coke is recognied as worth more than odd lots that are picked up in the open market as the operator renders service by shipping coke just as the furnace needs it and the quality is regular. On the other hand, some of the February adjustments proved unsatisfactory, the open market declining during the month more than had been expected when the settlements were made, and in a number of instances furnaces had something coming to them in the March adjustment, to equalize.

Operators holding contracts calling for "last Government price" have made no further adjustment. In the majority of cases a voluntary adjustment was made to $5, the Government price having been $6, but some contracts have thus far not been adjusted at all. Operators who made the $5 adjustment are hoping that pig iron prices will be reduced so that demand may be stimulated and coke consumption increased.

The spot and prompt market has declined farther. Several fair-sized lots of furnace coke for March shipment have been offered at $4, and odd lots for spot shipment are easily picked up at this figure in the few cases in which they are needed, while $4.25 appears to be the highest price that is seriously quoted. So much more 72-hour coke is made, especially with the present four-day and five day operations, than is needed by the foundries that some operators are offering foundry coke at $4.50 or possibly at less. One or two established operators making a specialty of foundry coke are still adhering to $6 as they have contracts to protect and are not interested in the small lots they could sell by cutting prices. The market for spot and prompt coke is quotable as follows: Furnace, $4@4.25; foundry, $4.50@6, per net ton at ovens.

The "Courier" reports coke production in the Connellsville and Lower Connellsville region in the week ended Mar. 1 at 224,872 tons, a decrease of 8740 tons.

Middle Western

GENERAL REVIEW

Better feeling in Middle West due to an improvement in market conditions. Peculiar situation in Iowa.

During the past week there has been an improvement in market conditions. This change for the better is noticeable, although it is not much to brag about. The demand for both steam and domestic coals has been better since Mar. 1 than at any time since the beginning of this year. Briefly, the reasons for this slight strengthening of the market are—first, the weather has been cold, and considerable domestic coal has moved as a consequence; second, storage piles are being rapidly depleted, and buyers have come to the conclusion that it is a wise plan to have plenty of coal on hand during these times of labor unrest; third, the contract season is upon us, and some trial coal is being shipped. It is believed that the market will improve a little from now on, although it will take a tremendous amount of improvement to put the market back into anything resembling a satisfactory condition.

Contrary to prevailing opinions outside of the coal industry, prices are firm, with no signs of weakening, so far as good coal is concerned. The buying public has adapted itself to the new and advanced prices, effective Feb. 1, for coal from southern Illinois, and the fourth vein Indiana fields. It is expected that other coal fields in the Middle West, now marketing their product on the basis of the late Government prices, will raise their prices. These increases are logical, and to be expected. The selling prices set by the Government allowed only a small margin of profit on full running time, and with conditions as at present, with mines operating at from 30 to 50 per cent. capacity, the operators cannot hope to break even unless they charge more for their coal. So far as the buying public is concerned, it is becoming more and more suspicious of bargains in coal. When an operator or jobber, during these times, is forced to sell his coal below cost, there is a reason for it; and that reason is—the coal is usually off grade.

Taking the coal operators as a unit, they are all confronted at this time with the same problem. That problem is, what shall they do with their steam sizes or screenings? Manufacturing today is at a low ebb. The mines, therefore, have little demand for steam coals. The competition for steam business is consequently keen, and there is a natural tendency toward price cutting. To overcome this, some of the operators' associations are talking of storing coal for themselves, rather than selling their product to a factory at a less price and allow others to store the coal and make a profit. The operators figure that it will be but a short time before the country will absorb all the steam coal available.

Some progress is being made on the railroad fuel question, and the operators in this territory are more than pleased over the progress made at Washington by the Railroad Fuel Committee of the National Coal Operators' Association. It is generally felt that this question, so long a thorn in the side of the industry, will soon be settled on a basis fair to all.

Eastern coal is moving more freely into this territory. Iowa and South Dakota seem to be ordering the most liberally, with northern Illinois a close third. A rather curious situation has developed in Iowa. During the war but little Eastern coal reached Iowa, but that state was given the highest grade products from Illinois to replace the temporarily absent southeastern Kentucky block, Pocahontas and West Virginia splint. Besides Illinois coal, Iowa consumed a large tonnage of coal mined within her own borders. The native fuel was used for the cheap domestic trade and for steam purposes. The Illinois coal was utilized by the trade, both steam and domestic, who wanted the best to be had. The native coals have a low freight rate, while the fuel imported from Illinois has a comparatively heavy rate. Men closely in touch with trade conditions freely predict that Iowa, from now on, will purchase its cheap coal from its own mines, and its high-grade fuels from Kentucky and West Virginia. To sum up the situation, if Iowa wants cheap coal, it will use the most inexpensive it can get—namely, its own—and if it wants expensive coal, it will draw on the highest grade fields of the East.

While it is admitted the situation in the Middle West is a little better, it is due to national conditions, and not the individual efforts of coal companies, who have covered the territory with salesmen and advertising matter.

CHICAGO

Little signs of activity. Cold weather helps domestic trade, but has no effect on steam business.

Conditions in this city are not so favorable to the coal industry as at other points throughout the Middle West. There are no signs of renewed industrial activity. On the contrary, factories are closing down, or running from two to three days per week. The weather has been cold, with a good snow storm, but this has only served to help out the domestic trade, having little or no effect on steam business. As is true with the rest of this Middle West territory, Chicago is ordering out more eastern coal than heretofore. This undoubtedly is because the various retail dealers throughout the city have succeeded in reducing the storage coal they have on hand.

Current prices per ton for Illinois and Indiana coal are as follows:

ILLINOIS

	F.o.b. Mines	Rate to Chicago
Southern Illinois		
Franklin, Saline and Williamson Counties,		
Prepared sizes	$2.75	$1.55
Mine-run	2.35 @ $2.50	1.55
Screenings	2.05	1.55
Central Illinois		
Springfield District		
Prepared sizes	2.55 @ 2.75	1.32
Mine-run	2.35	1.32
Screenings	2.05	1.32
Northern Illinois		
Prepared sizes	3.25	1.24
Mine-run	3.00	1.24
Screenings	2.75	1.24

INDIANA

Clinton 4th Vein District		
Prepared sizes	2.55 @ 2.75	1.27
Mine-run	2.35	1.27
Screenings	2.05	1.27
Knox County Field		
Prepared sizes	2.55 @ 2.75	1.37
Mine-run	2.35	1.37
Screenings	2.05	1.37

MILWAUKEE

Little improvement in the coal situation so far as demand is concerned. Prices still maintained, however.

The coal market continues dull and uninteresting. The demand is light all around and stocks are not dwindling to any great extent. The interior country is fairly well off in supplies, because of the mild weather. It is estimated that the wood-burning campaign of last fall saved 20,000 tons of coal on farms and in schoolhouses. Prices are well maintained as yet, nothwithstanding reports of cutting by western producers.

Milwaukee city authorities have decided to make a test of Illinois and eastern coal before letting contracts for the fuel supply for the various city institutions. Last year the bids of western producers were turned down, notwithstanding the same were $31,832 lower than the offers submitted by the dock companies. The action was taken mainly because of the uncertainty of rail transportation. The efficiency of western coal since tried out at one water station was 12 per cent. greater than that of eastern coal. On this basis Mayor Hoan declares the city was a loser to the extent of $62,172 by discarding the bids of Illinois operators last year.

Following are the coal prices at Milwaukee, per short ton, effective Mar. 1. The prices given include delivery. At the yards the prices are 50c. per ton less:

Domestic

Anthracite—	Short Ton
Egg	$12.20
Stove	12.40
Nut	12.50
Pea	11.00
Buckwheat	10.60
Bituminous—	
Pocahontas mine-run	$8.15
Hocking, screened	7.90
Youghiogheny, screened	7.90
Pittsburgh, No. 8, screened	7.90
West Virginia, screened	8.40
Splint, screened	8.40
Kentucky, screened	8.40
Illinois, screened	7.25
Coke—	
Solvay, large sizes	$11.50
Solvay, small sizes	10.25
Smithing	8.40
Steam—	
Youghiogheny, Hocking and Pittsburgh	
No. 8, screened	$7.18
No. 8, pile run	6.93
No. 8 screenings	6.68
West Virginia, Kentucky and splint	
Screened	7.68
Pile run	7.43
Screenings	7.18
Illinois and Indiana, screened	6.50
Pile run	6.25
Screenings	6.00
Smithing	7.68

ST. LOUIS

Warm weather continues, with no market for either steam or domestic. Standard coal going at below cost and demoralized conditions prevail in all fields, with nothing optimistic to look forward to at present. Country business slow. Light demand for anthracite and smokeless, and coke is heavy.

There is no demand for any kind of coal locally except in small quantities. The domestic tonnage is extremely light and this condition is not only representative of St. Louis proper, but is general throughout this section of the country. This has kept the dealers from laying in any large stocks.

With coal that continues to go down in price and rumors of the situation in the Fifth and Ninth districts, the steam trade on Standard coals will not lay in any supply and only buys from day to day.

The tonnage of steam coal, however, is light. Storage piles continue to be cleaned up and the manufacturing industries in a general way throughout the Mississippi Valley are below normal in their coal requirements.

Locally, the demand in a domestic way for anthracite is extremely light. The dealers have good supplies on hand. There is some dissatisfaction over the high prices and the poor preparation and quality.

There is a little smokeless from West Virginia coming in, but the demand is easy on this and dealers are going to go slow on storage supplies. Gas house and byproduct coke is heavy. The price seems too high, for the public buying is light and in small quantities only.

Operating conditions in the Fifth and Ninth districts are at low ebb. The mines that work for the most part are selling below the cost of production. There is considerable dissatisfaction among the miners on account of not being able to get sufficient working time to make actual living expenses. Many of these have bought Liberty Bonds and are being pushed for payments.

Screenings keep many of the mines from working and some of these plants have screenings on hand as long as four and five weeks. Nut sizes are also heavy, and the lump is not moving any too well. Car supply is good and transportation fair. Prices on all Standard coals are below the Government price.

In the Mt. Olive field working conditions are not all that could be desired, but the price is being maintained in a general way. There was a cut made by the Consolidated Coal Co. on local shipments to $2.30 on domestic sizes. This is the first break in price in this field. A fairly good tonnage of this coal is moving north and west, but steam sizes are heavy.

The railroad tonnage out of both the Standard and Mt. Olive fields seems to become lighter, but it helps considerably even at that.

In the Carterville field of Williamson and Franklin Counties, as well as in the Du Quoin field, steam sizes from No. 1 nut down are piling up on the tracks with no place to move them. At some mines even lump and egg are slow, and in a general way the market is not available for the tonnage from these fields. The mines, however, for the most part are getting from three to five days a week and conditions are more satisfactory in these fields than in other sections of the state. Car supply and transportation are good. There is no great dissatisfaction among the miners in these fields, but there is an oversupply of labor.

The prevailing circular per net ton f.o.b. mines is as follows:

Franklin County	Mt. Olive and Staunton	Standard
Prepared sizes, lump, egg, Nos. 1 and 2 nut	$2.75	.....
Williamson County		
Prepared sizes, lump, egg, nut	$2.55	$2.55	$1.90@2.25
Mine-run	2.20	2.20	1.60@1.70
Screenings	2.05	2.05	.95@1.10
3-in. lump	....	2.30	.....
2-in. lump	....	....	1.75@1.90

Williamson-Franklin rate to St. Louis is $1.10; other rates 92½c.

Coal and Coke Securities

New York Stock Exchange Closing Quotations Mar. 10, 1919

STOCKS	Ticker Abvn.	Bid	Asked
American Coal Co. of Allegheny	(ACL)	45	....
Burns Brothers, Com	(BB)	143	146
Burns Brothers, Pfd	(BB)	110	115
Central Coal & Coke, Com	(CK)	55	....
Central Coal & Coke, Pfd	(CK)	63	....
Colorado Fuel & Iron, Com	(CF)	41¼	42
Colorado Fuel & Iron, Pfd	(CF)	99	125
Consolidation Coal of Maryland	(CGM)	75	....
Elk Horn Coal, Com	(EH)	27¼	28
Elk Horn Coal, Pfd	(EH)	....	47
Island Creek Coal, Com	(ICR)	39	....
Island Creek Coal, Pfd	(ICR)	75	....
Jefferson & Clearfield Coal & Iron, Pfd	(JF)	60	....
New Central Coal of West Va	(NCC)	5	....
Pittsburgh Coal, Com	(PC)	49	49¼
Pittsburgh Coal, Pfd	(PC)	85¾	86¾
Pond Creek Coal	(PD)	13	14
Virginia Iron, Coal & Coke	(VK)	56	60

*Ex. Div.

BONDS	Bid	Asked
Cahaba Coal, 1st Gtd., 6s, 1922	90	....
Clearfield Bituminous Coal, 1st 4s, Ser. A., 1940	71	....
Colorado Fuel & Iron, Gen. 5s, 1943	89	90
Colorado Indus. 1st Mtg. & Col. Tr. 5s, 1934	73½	75
Consolidation Coal of Maryland, 1st Ref. 5s, 1950	88	91
Grand River Coal & Coke, 1st 6s, 1919	....	....
Jefferson & Clearfield Coal & Iron, 2d Mtg. 5s, 1926	96½	....
Lehigh Valley Coal, 1st Gtd. 5s, 1933	97¾	....
Lehigh Valley Coal, Gtd. Int. Red. to 4%, 1933	79¾	....
Lehigh Val. Coal & Nav. Con. S. F., 4½s. Ser. A, 1954	90	....
Pleasant Valley Coal, 1st S. F. 5s, 1928	80¾	....
Pocahontas Coal & Coke, Joint 4s, 1941	83½	89
Pocahontas Con. Collieries, 1st S. F. 5s, 1957	81½	83
Roch. & Pitts. Coal & Ir., Helvetia Pur. Money 5s, 1946	98	....
St. L., Rocky Mnt. & Pac. Stamped 5s, 1955	81½	83
Tenn. Coal, Iron & R.R., Gen. 5s, 1951	92	95½
Utah Fuel, 1st Sinking Fund, 5s, 1931	87	....
Victor Fuel, 1st Mtg. Sinking Fund 5s, 1953	50	70
Virginia Iron, Coal & Coke 1st 5s, 1949	87⅞	89¾

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

PIG IRON—Quotations are f.o.b. cities named, unless noted otherwise.

	Current	One Month Ago
CINCINNATI		
No. 2 Southern	$35.85	$37.60
Northern Basic	31.80	34.80
Southern Ohio No. 2	32.80	35.80
NEW YORK, Tidewater delivery		
Penna. 2X	36.15	39.55
Southern No. 2 (Silicon 2.25 to 2.75)	39.95	.....
BIRMINGHAM		
No. 2 Foundry	31.00	34.00
PHILADELPHIA		
Eastern Pa. 2X	36.15*	39.15*
Virginia No. 2	38.10†	40.50†
Basic	33.90*	36.90*
Grey Forge	33.90*	36.90*
Bessemer	.....	39.10*
CHICAGO		
No. 2 Foundry Local	31.00	34.50
No. 2 Foundry Southern	37.20	39.00
PITTSBURGH, including freight charge from the Valley		
No. 2 Foundry Valley	31.00	35.40
Basic	30.00	34.40
Bessemer	32.20	36.60

*F.o.b. furnace. †Delivered

STRUCTURAL MATERIAL—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill Pittsburgh	New York Current	New York One Year Ago	St. Louis	Chicago
Beams, 3 to 15 in.	$2.80	$4.07	$4.19½	$4.14	$4.07
Channels, 3 to 15 in.	2.80	4.07	4.19½	4.14	4.07
Angles, 3 to 6 in., ¼ in. thick.	2.80	4.07	4.19½	4.14	4.07
Tees, 3 in. and larger	2.80	4.12	4.19½	4.14	4.07
Plates	3.00	4.27	4.44½	4.14	4.27

BAR IRON—Prices in cents per pound at cities named are as follows:

Pittsburgh	St. Louis	Denver	Birmingham
2.90	4.04	4.65	4.20

NAILS—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St. Louis	Denver	Chicago	Birmingham	San Francisco	Dallas
Wire	$3.50	$4.37	$5.11	$4.37	$4.50	$5.35	$4.75
Cut	5.00	6.50	5.61	6.50	.....	6.75	.....

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh	Cincinnati	Chicago	St. Louis	San Francisco	Birmingham	Denver
Standard railroad spikes ⅜-in. and larger	$3.70	$6.00	$4.50	$5.04	$6.15	$5.65	$5.55
Track bolts	4.90	8.90	5.50	Prem.	7.50	8.00	6.55
Standard section angle bars	....	....	4.45	Prem.	5.15	....	4.95

COLD DRAWN STEEL SHAFTING—From warehouse to consumers requiring fair-sized lots, the following discounts hold:

Cincinnati	Cleveland	Chicago	St. Louis	Denver	Birmingham
17½%	List +7%	List +9%	+15%	+30%	+20%

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Cincinnati	Chicago	St. Louis	Denver	Birmingham
Straight	$6.25	$7.75	$6.50	$7.25	$8.50	$7.60
Assorted	6.40	7.75	6.50–7.00	6.40	8.75	7.85

Cincinnati—Horseshoe nails sell for $4.50 to $5 per 25-lb. box.

CAST-IRON PIPE—The following are prices per net ton for carload lots:

	New York Current	New York One Month Ago	New York One Year Ago	Chicago	St. Louis	San Francisco
4 in.	$65.70	$65.70	$58.35	$64.80	$58.00	$82.50
6 in. and over	62.70	62.70	55.35	61.80	55.00	79.50

Gas pipe and 16-ft. lengths are $1 per ton extra.

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh Current	Pittsburgh One Year Ago	Chicago Current	Chicago One Year Ago
Standard Bessemer rails	$55.00	$55.00	$67.00	$60–65
Standard openhearth rails	57.00	57.00	65.00	63–65
Light rails,* 8 to 10 lb.	3.135 (100 lb.)	3.125*	3.135 (100 lb.)	3.135*
Light rails, 12 to 14 lb.	3.09 (100 lb.)	3.125*	3.09 (100 lb.)	3.09*
Light rails, 25 to 45 lb.	3.00 (100 lb.)	3.125*	3.00 (100 lb.)	3.00*

*Per 100 lb.

OLD MATERIAL—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges:

	New York	Chicago	St. Louis
No. 1 railroad wrought	$17.00	$15.00	$17.00
Stove plate	15.00	15.00	16.00
No. 1 machinery cast	22.00	20.00	20.00
Machine shop turnings	6.50	6.00	7.50
Cast borings	9.50	7.00	10.50
Railroad malleable cast	13.50	15.50	17.00

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Denver
$0.12	$0.16½	$0.18	$0.13	$0.18½

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Birmingham
Solid	16c.	13c.	15c.
Hollow	24c.	...	...

PIPE—The following discounts are for carload lots f.o.b. Pittsburgh: basing card of Jan. 1, 1919 for steel pipe and for iron pipe:

BUTT WELD

Inches	Steel Black	Steel Galvanized	Inches	Iron Black	Iron Galvanized
⅛, ¼ and ⅜	47%	20½%	¾ to 1¼	36%	20%
½	51%	36½%			
¾ to 3	54%	40½%			

LAP WELD

2	47%	34½%	2	29%	15%
2½ to 6	50%	37½%	2½ to 4	31%	18%

BUTT WELD, EXTRA STRONG PLAIN ENDS

⅛, ¼ and ⅜	43%	25½%	¾ to 1¼	36%	21%
½	48%	35½%			
¾ to 1¼	52%	39½%			

LAP WELD, EXTRA STRONG PLAIN ENDS

2	45%	33½%	2	30%	17%
2½ to 4	48%	36½%	2½ to 4	32%	20%
4½ to 6	47%	35½%	4½ to 6	31%	19%

Stocks dicounts in cities named are as follows:

	New York Black	New York Galvanized	Cleveland Black	Cleveland Galvanized	Chicago Black	Chicago Malvanized
⅛ to 3 in. steel butt welded	43%	27%	43%	26%	44.9%	29.9%
⅛ to 3 in. steel lap welded	38%	23%	39%	23%	40.9%	26.9%

Malleable fittings. Class B and C, from New York stock sell at list + 12½%. Cast iron, standard sizes, 10% off.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York and St. Louis
Galvanized iron rigging	+17½%
Galvanized cast steel rigging	+2½%
Bright plain rigging	30%
Bright cast steel	17½%
Bright iron and iron tiller	List

STEEL SHEETS—The following are the prices in cents per pound from jobbers' warehouse at the cities named:

	Pittsburgh, Mill in Carloads	New York Current	New York One Month Ago	New York One Year Ago	Cleveland Current	Chicago Current
*No. 28 black	4.70	6.22	6.22	6.45	5.75	6.22
*No. 26 black	4.60	6.12	6.12	6.35	5.65	6.12
*Nos. 22 and 24 black	4.55	6.07	6.07	6.30	5.60	6.07
Nos. 18 and 20 black	4.50	6.02	6.02	6.25	5.50	6.02
No. 16 blue annealed	4.10	5.37	5.37	5.65	4.95	5.37
No. 14 blue annealed	4.00	5.27	5.27	5.55	4.85	5.27
No. 10 blue annealed	3.90	5.17	5.17	5.45	4.75	5.17
*No. 28 galvanized	6.05	7.57	7.57	7.70	7.15	7.57
*No. 26 galvanized	5.75	7.27	7.27	7.40	6.85	7.27
No. 24 galvanized	5.60	7.12	7.12	7.25	6.70	7.12

* For painted corrugated sheets add 30c. per 100 lb. for 25 to 28 gage; 25c. for 19 to 24 gages; for galvanized corrugated sheets add 15c., all gages.

SHOP SUPPLIES

NUTS—From warehouse at the places named, on fair sized orders, the following amount is deducted from list:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Hot pressed square	$0.80	$1.00	$1.25	$1.40	$0.98	$1.05
Hot pressed hexagon	.80	1.00	1.10	1.20	.78	.85
Cold punched square	2.50*	1.00	1.00	.75	1.00	1.00
Cold punched hexagon	2.50*	1.00	1.00	.75	1.00	1.00

* List plus.

Semi-finished nuts sell at the following discounts from list price:

	Current	One Year Ago
New York	50—10%	40%
Chicago	50%	50%
Cleveland	60%	60%

MACHINE BOLTS—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago
⅜ by 4 in. and smaller	40—10%	50%	40%
Larger and longer up to 1 in. by 30 in	25—5%	30%	25—5%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers:
New York..$1.25 Cleveland..$1.25 Chicago..$1.75

For cast-iron washers the base price per 100 lb. is as follows:
New York..$6.00 Cleveland..$4.25 Chicago..$4.50

RIVETS—The following quotations are allowed for fair sized orders from warehouse:

	New York	Cleveland	Chicago
Steel ½ and smaller	40%	45%	45%
Tinned	30%	45%	40%

Boiler, ¾, ⅞, 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:
New York..$6.60 base Cleveland..$5.15 Chicago..$5.47 Pittsburgh...$4.65

Structural, same sizes:
New York..$5.67 Cleveland..$5.25 Chicago..$5.57 Pittsburgh...$4.75

CONSTRUCTION MATERIALS

LINSEED OIL—These prices are per gallon:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Raw in barrel	$1.50	$1.31	$1.65	$1.35	$1.66	$1.36
5-gal. cans	1.63	1.41	1.80	1.50	1.86	1.46

WHITE AND RED LEAD—Base price.

	Red Current Dry	Red Current In Oil	Red 1 Year Ago Dry	Red 1 Year Ago In Oil	White Current Dry and In Oil	White 1 Year Ago Dry and In Oil
100-lb. keg	13.00	14.50	12.25	12.50	13.00	12.25
25 and 50-lb. kegs	13.25	14.75	12.50	12.75	13.25	12.50
12½-lb. keg	13.50	15.00	12.75	13.00	13.50	12.75
5-lb. cans	15.00	16.50	14.25	14.00	15.00	14.50
1-lb. cans	16.00	17.50	14.25	14.50	16.00	14.50

500 lb. lots less 10% discount. 2000 lb. lots less 10–2½% discount.

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:
Cincinnati..$15 and 16 Birmingham..$15.00
St. Louis, salmon..12.00 Denver..12.00

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York, St. Louis, Chicago and San Francisco.

	1-Ply C.l.	1-Ply L.C.l.	2-Ply C.l.	2-Ply L.C.l.	3-Ply C.l.	3-Ply L.C.l.
No. 1 grade	$1.35	$1.60	$1.70	$1.95	$2.05	$2.30
No. 2 grade	1.20	1.45	1.50	1.75	1.80	2.05

Asbestos asphalt saturated felt (14 lb. per square) costs $5.00 per 100 lb.
Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs $2.10 per roll in carload lots and $2.35 for smaller quantities.
Shingles, red and green slate finish cost $5.75 per square in carloads, $5.75 in smaller quantities, in Philadelphia.

ROOFING MATERIAL—Prices per ton f. o. b. New York and Chicago:

	Carload Lots N. Y.	Carload Lots Chicago	Less Than Carload Lots N. Y.	Less Than Carload Lots Chicago
Tar felt (14 lb. per square of 100 sq.ft.)	$54.00	$52.00	$55.00	$53.00
Tar pitch (in 400-lb. bbl.)	21.00	18.00	22.00	19.00
Asphalt pitch (in barrels)	36.00	36.00	41.50	41.50
Asphalt felt	67.50	67.50	72.00	72.00

HOLLOW TILE—Price per block in carload lots for hollow building tile:

	4x12x12	8x12x12	12x12x12
St. Paul	$0.056	$0.11	$0.162
Cincinnati	.086	.165	.218
Seattle	.09	.175	.30
Los Angeles*	.074	.144	.181
New Orleans	.16	.20	.29

*F. o. b. factory, 4, 8 and 10 inch.

LUMBER—Price of yellow pine per M in carload lots:

	1-in. Rough 10 In. x 16 Ft.	2-In. T. and G. 10 In. x 16 Ft.	8 x 8 In. x 20 Ft.
St. Louis	$38@41	$38.00	$40.00
Birmingham	32.00	34.00	32.00
Denver	43.25	35.00	43.00
Cincinnati	43.00	42.00	37.00

EXPLOSIVES—Price per pound of dynamite in small lots and price per 25-lb. keg for black powder:

	Low Freezing 20%	Gelatin 40%	Gelatin 60%	Gelatin 80%	Black Powder
New York	.....	$0.29½	$0.34½	.....	$2.40
Boston	$0.22½	.26½	.31½	$0.35½	2.65
Cincinnati	.18½	.22½	.26½	.....	2.35
Kansas City	.20½	.25½	.30½	.38½	2.45
New Orleans	.20½	.26½	.31½	.37½	2.60
Seattle	.....	.25½	.32½	.....	.....
Chicago	.18½	.22½	.30	.36	2.35
St. Paul	.19	.25½	.30½	.....	2.45
St. Louis	.19	.25½	.30½	.36½	.....
Denver	.17½	.24	.29	.35	2.45
Dallas	.21	.25	.29	.39	.....
Los Angeles	.25	.31	.36	.42	.....

MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	St. Louis	Birmingham	Denver
Cup	7	7.2	8½	14¼
Fiber or sponge	8	13	9	18
Transmission	7	13	9	20
Axle	4½	4½	4½	5½
Gear	4½	7½	7½	8
Car journal	22 (gal.)	4.9	9½	8

BABBITT METAL—Warehouse prices in cents per pound:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Best grade	87.00	70.00	77.00	93.00	75.00	70.00
Commercial	42.00	40.00	18.50	22.00	15.00	25 @ 50

HOSE—Following are prices of various classes of hose:

Fire

	50-Ft. Lengths
Underwriters' 2½-in	80c. per ft.
Common, 2½-in	30%

Air

	First Grade	Second Grade	Third Grade
¾-in. per ft	$0.55	$0.40	$0.30

Steam—Discounts from list
First grade..25% Second grade..35% Third grade..40%

LEATHER BELTING—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
St. Louis	45%	50%
Denver	35–5%	30%
Birmingham	30%	35%
Chicago	45%	35%
Cincinnati	40–10%	30%

RAWHIDE LACING—50% for cut; 45c. per sq.ft. for ordinary.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$0.90
Asbestos for high-pressure steam	1.60
Duck and rubber for piston packing	1.00
Flax, regular	1.20
Flax, waterproofed	1.60
Compressed asbestos sheet	1.00
Wire insertion asbestos sheet	1.20
Rubber sheet	.60
Rubber sheet, wire insertion	.80
Rubber sheet, duck insertion	.50
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.20
Asbestos wick, ½- and 1-lb. balls	.85

MANILA ROPE—For rope smaller than ¾-in. the price is ½ to 2c. extra; while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ¾-in., 8 ft.; ⅞-in., 6; 1-in., 4½; 1 in., 3½; 1¼-in., 2 ft. 10 in.; 1½-in., 2 ft. 4 in. Following is price per pound for ¾-in. and larger, in 1200-ft. coils:

Boston	$0.32	Birmingham	$0.38
New York	.30½	Denver	.32
Cincinnati	.33	Kansas City	.32½
Chicago	.30½	Seattle	.24
St. Paul	.32	St. Louis	.21½
San Francisco	.29		

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING Pipe Size	Standard List Per Lin. Ft.	BLOCKS AND SHEETS Thickness	Price per Sq.Ft.
1-in.	$0.27	½-in.	$0.27
2-in.	.36	1 -in.	.30
6-in.	.80	1½-in.	.45
4-in.	.60	2 -in.	.60
3-in.	.45	2½-in.	.75
8-in.	1.10	3 -in.	.90
10-in.	1.30	3½-in.	1.05
85% magnesia high pressure			List
For low-pressure heating and return lines		4-ply	58% off
		3-ply	60% off
		2-ply	62% off

WIRING SUPPLIES—New York prices for tape and solder are as follows:

Friction tape, ⅙ lb. rolls	48c. per lb.
Rubber tape, ½-lb. rolls	60c. per lb.
Wire solder, 50-lb. spools	46c. per lb.
Soldering paste, 2-oz. cans	$1.20 per doz.

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire in following cities:

No.	Denver Single Braid	Denver Double Braid	Denver Duplex	St. Louis Single Braid	St. Louis Double Braid	St. Louis Duplex	Birmingham Single Braid	Birmingham Double Braid	Duplex
14	$15.00	$19.00	$35.00	$12.00	$16.00	$33.00	$12.00	$17.35	$29 90
10	23.15	29.05	51.70	27.20	31.00	69.00	23.10	23.60	52 80
8	32.60	39.20	71.05	38.00	42.00	78.00	32.10	41.10	.....
6	54.40	54.60	.....	.....	65.00	130.00	55.40	65.90	.....
4	77.50	76.85	.....	.....	93.00	.....	72.65	90.00	.....
2	115.30	111.10	.....	.....	140.00	.....	115.00	129.50	.....
1	150.05	145.60	.....	.....	182.00	.....	155.50	168.50	.....
0	.....	176.80	.....	.....	242.00	.....	199.50	219.00	.....
00	.....	217.60	.....	.....	290.00	.....	245.50	261.50	.....
000	.....	295.95	.....	.....	360.00	.....	299.50	317.00	.....
0000	.....	323.10	.....	.....	435.00	.....	365.00	378.50	.....

FREIGHT RATES—On finished steel products in the Pittsburgh district including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, bolts, flat sheets (except planished), chains, etc., the following freight rates per 100 lb. are effective:

Boston	$0.30	New Orleans	$0.38½
Buffalo	.17	New York	.27
Chicago	.27	Philadelphia	.24½
Cincinnati	.23	St. Louis	.24
Cleveland	.17	St. Paul	.49½
Denver	.99	Pacific Coast (all rail)	1.25*
Kansas City	.59		

Note—Add 3% transportation tax. *Minimum carload, 80,000 lb.